

ARIZONA JOURNAL OF ENVIRONMENTAL LAW & POLICY

VOLUME 14

FALL 2023

ISSUE 1

UNDERFUNDED AND UNDERAPPRECIATED: UNFCCC'S TECHNOLOGY MECHANISM AND THE NEED FOR STABLE FUNDING

Sam Stephens*

Abstract

This Article examines the United Nations Framework Convention on Climate Change's (UNFCCC) Technology Mechanism and efforts to improve upon the work it has engaged in over the past decade. Created in 2010, the Technology Mechanism was the culmination of a nearly two decade-effort by the UNFCCC to establish an entity to facilitate the implementation of climate technology in developing countries. Like the UNFCCC, the Technology Mechanism is primarily funded by contributions from developed countries. Since its establishment, the Technology Mechanism has completed hundreds of projects helping developing countries obtain and develop the climate technologies they need to mitigate and adapt to climate change. Despite its successes, developing countries are not where they need to be to adequately mitigate and adapt to climate change, and many have called upon the Technology Mechanism to do more. Criticisms and suggested improvements have spanned from ambitious restructurings of the Technology Mechanism to simply increasing funding to the body. One critical issue the Technology Mechanism has faced is unpredictable and inconsistent funding. Developing countries have frequently advocated for establishing consistent multi-year funding to the Technology Mechanism, and this Article echoes these calls. By providing concrete funding years in advance, the Technology

* Thank you to Professor Jessica Owley and to Tracy Bach for providing me the opportunities to travel to several UNFCCC meetings to see how the Technology Mechanism worked firsthand. Without them, and their guidance, this paper would not have happened. Another thank you to Professor Stephen Minas for lending his expertise on the topic. Finally, one last thank you to all of the members of the CTCN and the TEC for their willingness to talk and indulge my many questions over the last year. It has been an honor to learn from each and every one of you.

Mechanism will have increased financial stability that can allow for increased planning and help it address other more substantive criticisms. With the establishment of a Joint Work Programme at COP 27 to help coordinate and streamline the work of the Technology Mechanism, improvements are continuing to be made. However, to fully realize these improvements and activate the full potential of the Technology Mechanism, consistent and predictable year-to-year funding is needed.

INTRODUCTION	97
PART I: BACKGROUND	101
A. Technology Transfer Before the Technology Mechanism	101
B. COP 16 and the Establishment of the Technology Mechanism	103
C. Paris Agreements and the Technology Mechanism	105
PART II: TECHNOLOGY MECHANISM AT WORK	106
A. Technology Executive Committee – Policy	107
B. Climate Technology Centre and Network – Implementation	109
i. CTCN Technical Assistance	110
ii. CTCN's Other Work	114
PART III: CRITICISMS OF THE TECHNOLOGY MECHANISM AND AREAS FOR IMPROVEMENT	115
PART IV: TECHNOLOGY MECHANISM AT COP 27: A NEW JOINT WORK PROGRAMME	118
PART V: CONSISTENT FUNDING FOR THE CTCN AND TECHNOLOGY MECHANISM IS NEEDED	123
CONCLUSION	126

“Those who have done the least to cause the problem are suffering the most. Even in the developed world, the marginalized are the first victims of disasters and the last to recover. Dear friends, let's be clear: human activities are at the root of our descent towards chaos. But that means that human action can help solve it.”

António Guterres, Secretary General of the United Nations¹

Introduction

Technology is at the forefront of discussions on solutions to combat climate change. Generally, climate technology includes a wide array of technologies that seek to reduce greenhouse gas emissions and minimize the impacts of climate change.² In 2022, roughly a quarter of all venture capital funding in the world went towards investments in climate technology.³ From the

¹ United Nations, *Secretary-General's address at Columbia University: "The State of the Planet,"* <https://www.un.org/sg/en/content/sg/statement/2020-12-02/secretary-generals-address-columbia-university-the-state-of-the-planet-scroll-down-for-language-versions> [<https://perma.cc/92GE-AA75>] (last visited Oct. 13, 2023).

² Emma Cox, Leo Johnson, *State of Climate Tech 2021*, PWC (2021), <https://www.pwc.com/gx/en/services/sustainability/publications/state-of-climate-tech.html#:~:text=Climate%20tech%20is%20defined%20as,to%20the%20impacts%20of%20climate> [<https://perma.cc/4S2Z-A7PT>].

³ Ryan Stanton, Mike Davies, *More than on quarter of all venture capital funding is going to climate technology, with increased focus on technologies that have the most potential to cut emissions*, PWC (Nov. 3, 2012).

start of 2018 through the third quarter of 2022, the private sector invested over \$260 billion in climate technologies.⁴

Despite these large numbers, the majority of these investments were targeted at companies working on technologies in developed countries that have resources and structures necessary to innovate at the highest level.⁵ From 2016 to 2021, the countries that saw the most investment in climate technology were among the richest in the world.⁶ The top ten countries in terms of climate technology investment included seven developed countries as well as three developing countries: China, India, and Singapore.⁷ Although these three countries are classified as “developing,” the label can be deceiving.⁸ Singapore for instance is second to only Luxembourg in global GDP per capita and is largely viewed as “Asia’s leading tech hub.”⁹ Meanwhile, China ranks second to only the United States in global GDP, more than doubling the GDP of any other country, and India is not far behind, ranking sixth according to data from 2020.¹⁰ Thus, the countries leading the way in climate technology are largely the countries with the most money.

Other developing countries, especially those under the United Nations’ “least developed countries (LDC)” classification, struggle tremendously to spur progress in technology and innovation.¹¹ These struggles are shown by a lack of research and development in these countries, which leads to slower economic growth and thus heightened struggles to transition to a green economy and make investments in climate technology.¹² Currently, several of the 46 LDCs are also among the most vulnerable countries in the world to the effects of climate change.¹³

<https://www.pwc.com/gx/en/news-room/press-releases/2022/state-of-climate-tech-report-2022.html>
[<https://perma.cc/M8VV-RRZA>].

⁴ *Id.*

⁵ Mehak Agarwal, *India among top 10 countries globally for climate tech investment; Europe fastest growing region: Report*, BUSINESS TODAY (Oct. 26, 2021), <https://www.businesstoday.in/latest/corporate/story/india-among-top-10-countries-globally-for-climate-tech-investment-europe-fastest-growing-region-report-310424-2021-10-26?onetap=true> [<https://perma.cc/75UX-ES2G>].

⁶ *Id.*

⁷ *Id.* (The ten countries with the most climate technology investment in 2020 were: United States (\$48 billion); China (\$18.6 billion); Sweden (\$5.8 billion); United Kingdom (\$4.3 billion); France (\$3.7 billion); Germany (\$2.7 billion); Canada (\$1.4 billion); Netherlands (\$1.3 billion); India (\$1 billion); and Singapore (\$700 million)).

⁸ *World Economic Situation and Prospects 2022*, UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, at 154, U.N. Sales No. E.22.II.C.1 (2022).

⁹ *The 50 richest countries in the world*, WORLDDATA.INFO (Last visited Feb. 9, 2023).

<https://www.worlddata.info/richest-countries.php>; See Dario Acconci, *Singapore Upholds Its Position As Asia’s Leading Tech Hub Despite Global Corporate Tax Rate Increases*, MONDAQ (Feb. 17, 2022)

<https://www.mondaq.com/new-technology/1162678/singapore-upholds-its-position-as-asia39s-leading-tech-hub-despite-global-corporate-tax-rate-increases#:~:text=Singapore's%20prime%20location%20at%20the,innovation%20hubs%20outside%20San%20Francisco> [<https://perma.cc/5JZE-BBUJ>].

¹⁰ *Richest Countries in the World 2023*, WORLD POPULATION REVIEW, <https://worldpopulationreview.com/country-rankings/richest-countries-in-the-world> [<https://perma.cc/V56A-2ZF7>] (last visited Feb. 9, 2023).

¹¹ Fekitamoeola ‘Utoikamanu, *Closing the Technology Gap in Least Developed Countries*, THE UN CHRONICLE (Dec. 2018), <https://www.un.org/en/chronicle/article/closing-technology-gap-least-developed-countries#:~:text=More%20importantly%2C%20low%20levels%20of,of%20science%2C%20technology%20and%20innovation> [<https://perma.cc/X949-AHAF>].

¹² *Id.*

¹³ *UN list of least developed countries*, UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (October 2022), <https://unctad.org/topic/least-developed-countries/list#:~:text=There%20are%20currently%2046%20economies,on%20technology%20among%20other%20concessions> [<https://perma.cc/RA6K-YDK5>]; United Nations Environment Programme, *Readiness and Preparatory Support Proposal: Reduce Sao Tome and Principe’s Vulnerability to climate change impacts by strengthening the*

One way to remedy these vulnerabilities and inequities is to promote technology transfer. The United Nations Framework Convention on Climate Change (UNFCCC) defines technology transfer as “. . . a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations (NGOs) and research/education institutions”¹⁴ Technology transfer allows developed countries to lend varying types of assistance, whether it be through importation of physical technology or flow of “know-how or experience,” to developing countries so that they can adopt clean technologies to prevent substantial damage from climate change and limit future carbon emissions.¹⁵ The UNFCCC currently facilitates technology transfer through its Technology Mechanism, an entity that uses money from developed countries to fund various projects, largely focused on the “know-how” side of technology transfer, and aimed at improving climate technology in developing countries where such technology is lacking.¹⁶

Prior to the creation of the Technology Mechanism, the UNFCCC attempted, and failed for over 15 years, to develop an approach to facilitating technology transfer.¹⁷ Several points of contention among developing and developed countries led to this delay, including determining the scope of the technology transfer work, whether to share intellectual property on climate technology, and how to garner support from the private sector.¹⁸ This struggle came to a conclusion in November 2010 when the UNFCCC held its sixteenth annual Conference of the Parties (COP) in Cancun, Mexico.¹⁹ Here, parties came together and with the support of the private sector, created the Technology Mechanism to “boost the innovation, development and spread of new climate-friendly technologies.”²⁰

Since its implementation, the Technology Mechanism has assisted developing countries “address both policy and implementation aspects of climate technology development and

Country's capacity to implement an integrated approach to adaptation planning, at 3 (April 23, 2020) (“Sao Tome and Principe (STP) is one of the most vulnerable countries to the effects of Climate Change”); Joe Lo, *Which countries are ‘particularly vulnerable’ to climate change?*, Climate Home News (Dec. 12, 2022) <https://www.climatechangenews.com/2022/12/08/which-countries-are-particularly-vulnerable-to-climate-change/#:~:text=Climate%20change%20is%20felt%20by,to%20be%20the%20most%20vulnerable> [https://perma.cc/PX85-QPPC]. (“The Notre Dame Institute judges . . . Niger to be the most vulnerable [country in the world to the effects of climate change].”).

¹⁴ *Technology Transfer*, GLOBAL ENVIRONMENTAL FACILITY (Last visited Feb. 9, 2023)

<https://www.thegef.org/what-we-do/topics/technology-transfer#:~:text=Technology%20transfer%20plays%20a%20critical,technologies%20cleaner%20and%20climate%20Dresilient> [https://perma.cc/4GFK-5WBJ].

¹⁵ David Popp, *International Technology Transfer, Climate Change, and the Clean Development Mechanism*, 16(2) REV. ENVIRON. ECON. POLICY 131, 136–37, 142 (June 2011).

¹⁶ See *id.*; *Technology Mechanism*, TT:CLEAR, <https://unfccc.int/ttclear/support/technology-mechanism.html> [https://perma.cc/RBC5-ERCH] (last visited June 4, 2023).

¹⁷ See Adebayo Majekolagbe, *The Evolution of the UNFCCC Environmentally Sound Technology Development and Transfer Framework*, 16(2) LAW, ENVIRONMENT AND DEVELOPMENT JOURNAL 112, 120–124 (2020).

¹⁸ *Id.* at 116, 120.

¹⁹ *COP 16*, UNITED NATIONS CLIMATE CHANGE, <https://unfccc.int/event/cop-16> [https://perma.cc/7KZE-GPLW] (last visited Feb. 9, 2023).

²⁰ United Nations Climate Change, *Cancún Climate Change Conference - November 2010* (Dec. 2010), <https://unfccc.int/conference/cancun-climate-change-conference-november-2010> [https://perma.cc/X2ER-9FLS].

transfer.”²¹ It does so through two bodies. The first, the Technology Executive Committee (TEC), is the policy body. TEC’s work includes producing reports and policy recommendations that can help guide countries in adopting climate technology laws and policies.²² The second body, the Climate Technology Centre and Network (CTCN), handles implementation. This work largely involves providing technical assistance on specific climate projects to developing countries that request it, but also includes other hands-on activities such as organizing regional events focused on improving the capacity of developing countries to implement measures on their own.²³ As of the end of 2022, the CTCN has engaged in over 300 technical assistance projects dating back to 2014.²⁴ These projects have provided technical assistance on climate technology projects to a wide range of countries including Benin, Ecuador, Indonesia, and Dominican Republic.²⁵ The projects have also ranged in type, including projects to implement systems and technologies aimed at improving water quality, waste management, and clean transportation.²⁶

Despite its work, the Technology Mechanism has received criticisms, which are largely rooted in the barriers that stood in the way of its creation. These include failing to sufficiently engage the private sector, having a lack of funding to make the impact that is needed, and having too narrow of a scope of work.²⁷ This Article explores these criticisms and discusses how they might be best addressed by the UNFCCC and its member-countries.

In 2022, at COP 27 in Sharm El-Sheikh, Egypt, the announcement of a new five-year Joint Work Programme with a promise to “accelerate the deployment of transformative climate technologies” to tackle climate change, brought renewed excitement to the Technology Mechanism.²⁸ As part of this announcement, a number of developed countries, including the United States and Germany, announced multimillion dollar grants to the Technology Mechanism’s new Joint Work Programme and several other countries committed to increase and continue funding to the Technology Mechanism as a whole.²⁹ Despite these commitments, the Technology Mechanism’s implementation body, the Climate Technology Centre and Network, currently has a funding gap of \$22 million for its current work program from 2023-2027, with only enough money

²¹ *Technology Mechanism: Enhancing climate technology development and transfer*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (2015)

https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEM/0e7cc25f3f9843ccb98399df4d47e219/174ad939936746b6bfad76e30a324e78.pdf [<https://perma.cc/UEZ4-Q7BK>].

²² *Technology Executive Committee*, TT: CLEAR, <https://unfccc.int/ttclear/tec> [<https://perma.cc/X5NW-Z9VV>] (last visited Feb. 16, 2023).

²³ *About the Climate Technology Centre and Network*, UN CLIMATE TECHNOLOGIES CENTRE & NETWORK, <https://www.ctc-n.org/about-ctcn> [<https://perma.cc/SN9H-BFXF>] (last visited April 21, 2023).

²⁴ *Active Technical Assistance*, UN CLIMATE TECHNOLOGIES CENTRE & NETWORK, <https://www.ctc-n.org/technical-assistance/data> [<https://perma.cc/DWB6-K46E>] (last visited Nov. 30, 2022).

²⁵ *Id.*

²⁶ *Id.*

²⁷ Karen Sullivan, *Implementing the UNFCCC Technology Mechanism and the 5 ‘Ps’*: Progress, Practicalities, Priorities, Pathways and the Public Sector, 15(1) LAW ENVIRONMENT AND DEVELOPMENT JOURNAL 12, 28 (2019); Majekolagbe, *supra* note 17, at 129.

²⁸ Keishamaze Rukikaire *Joint Work Programme of the UNFCCC Technology Mechanism Launched at COP27*, UN ENVIRONMENT PROGRAM, UN CLIMATE TECHNOLOGY CENTRE AND NETWORK, AND UN CLIMATE CHANGE (Nov. 15, 2022). <https://unfccc.int/news/joint-work-programme-of-the-unfccc-technology-mechanism-launched-at-cop27> [<https://perma.cc/X57Q-VEVR>].

²⁹ *Id.*

to continue operations through mid-2025.³⁰ Thus, despite areas of progress, it is clear there is work to do in order for the Technology Mechanism to realize its full potential.

This Article looks at the history and structure of the UNFCCC's Technology Mechanism and criticisms of it, as well as ways to improve upon the work that the Technology Mechanism has engaged in over the past decade. Despite the Technology Mechanism's progress, developing countries continue to make clear that they need more support in getting climate technology into their countries. Part II describes the history of technology transfer under the UNFCCC, including how the Technology Mechanism came to be in its current form. Part III looks at the work that the Technology Mechanism has engaged in since its establishment. Part IV considers criticisms of the Technology Mechanism with specific focus on its implementation body, the Climate Technology Centre and Network (CTCN). Part V examines recent Technology Mechanism developments, including the establishment of a new Joint Work Programme at COP 27. Finally, Part VI recommends that the Financial Mechanism and developed countries establish multi-year funding sources for the CTCN to create financial stability and predictability that could allow for more of a focus on improving and scaling up the work of the Technology Mechanism.

Part I: Background

A. Technology Transfer Before the Technology Mechanism

The goal of improving the transfer of technology between developed countries and developing countries was part of the original United Nations Framework Convention on Climate Change agreement in 1992.³¹ The original agreement explicitly focused and made commitments on “transfer of technology” to “the least developed countries” from developed countries to developing countries, especially those with social and geographical characteristics that make them more vulnerable to the effects of climate change.³² The Financial Mechanism, which facilitates sending money from developed countries and the private sector to support climate efforts in developing countries, was also defined in the original convention and specifically mentions

³⁰ *Draft CTCN Chapter of the 2023 Joint Annual Report*, Climate Technology Centre and Network, UN. Doc. AB/2023/22/18, at 15 (September 22–27, 2023) (See paragraph 76).

³¹ *United Nations Framework Convention on Climate Change*, U.N. Doc. FCCC/INFORMAL/84 GE.05-62220 (E) 200705 at 9 (1992).

³² *Id.* at Art. 4.5, 4.7–8 (Section 8 of Article 4 on “Commitments” lists eight characteristics of countries that should specifically receive attention in considering the development of technology transfer:

“(a) Small island countries;
(b) Countries with low-lying coastal areas;
(c) Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;
(d) Countries with areas prone to natural disasters;
(e) Countries with areas liable to drought and desertification;
(f) Countries with areas of high urban atmospheric pollution;
(g) Countries with areas with fragile ecosystems, including mountainous ecosystems;
(h) Countries whose economies are highly dependent on income generated from the production, processing, and export, and/or on consumption of fossil fuels and associated energy-intensive products; and
(i) Landlocked and transit countries.”).

funding of “transfer of technology” as one of its purposes.³³ Thus, the UNFCCC goal of establishing and funding avenues for transferring climate technology from developed, wealthier nations to developing countries is as old as the UNFCCC itself.

While the Financial Mechanism appeared in the 1992 agreement, a “Technology Mechanism” dedicated to facilitating technology transfer would not come to be until 2010. Prior to the establishment of the Technology Mechanism, the UNFCCC made several attempts to address, improve, and facilitate technology transfer from developed countries to developing countries.³⁴ But these efforts all fell short. A key issue with early UNFCCC technology transfer efforts was a lack of measures to ensure that actual implementation of transferring climate technology occurred, with every precursor to the Technology Mechanism lacking any means of implementing the policies it produced.³⁵

Another barrier to early attempts to effectively address technology transfer was the issue of intellectual property rights.³⁶ Developing countries voiced concerns that stronger intellectual property laws lead to a reduction in technology transfer, while developed countries maintained that these laws are necessary to gain adequate participation from the private sector in these efforts.³⁷ Much of this debate stemmed from developed countries representing the positions of the private sector. With the private sector largely located in developed countries, these countries, like the private sector, want to ensure that others are not able to capitalize off of their innovative products absent their own financial benefit.³⁸ Conversely, developing countries worried that strong intellectual property rights provided “monopoly pricing power,” which prevented the transfer of these technologies to developing nations.³⁹ Thus, developing countries largely advocated for a technology body that promoted the open sharing of climate technology research and development.⁴⁰

Unsurprising, developing countries pushed for stronger commitments to technology transfer and implementation, creating noticeable tension with developed countries.⁴¹ In 2008, the “Group of 77 (G77) and China,” a coalition of 134 developing countries, put forth a proposal similar to but more aggressive than the eventual Technology Mechanism.⁴² In addition to proposing two bodies within the mechanism, one dedicated to policy and one dedicated to implementation, the proposal also sought to prioritize “balancing rewards for innovators with the

³³ *Id.* at 14.

³⁴ *See generally* Majekolagbe, *supra* note 17, at 120–24, for a more detailed discussion of international and UNFCCC efforts to address technology development and transfer in the 2000s, 1990s, and earlier.

³⁵ *Id.* at 122. *See generally id.* at 120–26 for a discussion of UNFCCC efforts around technology transfer from 1992 to 2010.

³⁶ Patrick Karani & Jackton Boma Ojwang, *Intellectual Property in International Relations: Technology Transfer*, 17(3) SCIENCE COMMUNICATION 326, 326–27 (1996) (“The relationship between international politics and intellectual property rights (IPR) is a critical factor for the transfer of technology and for national development, in both the Third World and the industrialized nations. Too often, economic development is discussed in terms of facilitating the dissemination and use of technology alone, with insufficient attention to [intellectual property rights] that may affect transfer in the first place.”).

³⁷ Anna Dahlberg, *Are stronger intellectual property rights an obstacle or a condition for international technology transfer?* 4 (Graduate thesis, Mpazi Sinjela ed., Lund University Department of Law 2004) (on file with Lund University Libraries).

³⁸ Majekolagbe, *supra* note 17, at 120, 130–31.

³⁹ Martin Khor, *Climate Change, Technology and Intellectual Property Rights: Context and Recent Negotiations*, 45 SOUTH CENTRE RESEARCH PAPERS 1, 22 (April 2012).

⁴⁰ *Id.* at 18–19.

⁴¹ *Id.* at 122–23.

⁴² *Id.* at 126–27.

common good of humankind, including jointly developed technology and intellectual property rights sharing.”⁴³ Over the course of several UNFCCC meetings throughout 2008 and 2009, China and other G77 members submitted proposals stressing a commitment to addressing intellectual property rights barriers to technology transfer.⁴⁴ Even South Korea, a country that contributes significant money to UNFCCC efforts, stressed that intellectual property rights purely benefited private companies.⁴⁵ China also continued to push its proposal while maintaining the need to “find a way to share [intellectual property rights].”⁴⁶ Ultimately, UNFCCC parties rejected China’s proposal along with any other proposal involving the sharing of intellectual property rights, although a desire for the Technology Mechanism to do more remained.⁴⁷

In 2009, at COP 15 in Copenhagen, the topic of creating the Technology Mechanism emerged once again.⁴⁸ UNFCCC parties agreed on the broad framework of the Technology Mechanism, with a policy body and an implementation body, a critical point for the G77 and China.⁴⁹ However, issues such as linking the Financial Mechanism to a new technology mechanism, and including reference to intellectual property rights as a barrier to technology transfer, stood in the way of a deal at COP 15, which many saw as an overall failure due to the absence of a substantial deal on global climate goals.⁵⁰

B. COP 16 and the Establishment of the Technology Mechanism

Leading up to the 2010 COP 16 in Cancun, Mexico, much of the global discussions on climate were on reaching an agreement to cut emissions globally and to lock countries into commitments in a deal that would replace the expiring 1997 Kyoto Protocol.⁵¹ In the pre-Paris Climate Agreement world, this was a topic that dominated discussions in the media, as the expiration of the Kyoto Protocol meant there would be no international commitments to cut emissions.⁵² Thus, the stakes at COP 16 were notably high, with failure to reach an agreement

⁴³ *Proposal by the G7 & China for a Technology Mechanism under the UNFCCC*, UNFCCC 1-2, https://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/technology_proposal_g77_8.pdf [<https://perma.cc/46DP-DQAL>]; Khor, *supra* note 39, at 22.

⁴⁴ Khor, *supra* note 39, at 22–24.

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.* at 26.

⁴⁸ *Id.* at 127.

⁴⁹ *Id.*

⁵⁰ *Id.*; John Vidal, Allegra Stratton & Suzanne Goldenberg, *Low targets, goals dropped: Copenhagen ends in failure*, THE GUARDIAN (Dec. 18, 2009), <https://www.theguardian.com/environment/2009/dec/18/copenhagen-deal> [<https://perma.cc/HC2N-5LPM>].

⁵¹ Chris Buckley, *China digs in on rich-poor climate pact divide*, REUTERS (Oct. 7, 2010) <https://www.reuters.com/article/us-climate-un-china-idUKTRE6920B720101007> [<https://perma.cc/M9FT-HE4B>] (At the time, the Kyoto Protocol was “the U.N.’s main weapon in the fight against climate change” as it bound 40 wealthier countries to meet emissions targets.); Stacy Feldman, *U.S. Call to Preserve Copenhagen Accord Puts Climate Conference on Edge*, REUTERS (Nov. 29, 2010) <https://www.reuters.com/article/idUS273211516320101129> [<https://perma.cc/M9FT-HE4B>].

⁵² Chris Buckley & Russell Blinch, *China buoys climate talks with “binding” target*, REUTERS (Dec. 6, 2010) <https://www.reuters.com/article/cnews-us-climate-idCATRE6AR1OI20101206> [<https://perma.cc/HXX8-29JA>].

likely meaning “the [international climate negotiation] process risked dying.”⁵³ Luckily, at the last chance at 3:00 a.m. on the final night of COP 16, parties struck an agreement.⁵⁴ While the COP 16 agreement accomplished what it needed to, namely recording of commitments to cut greenhouse gas emissions that the countries had made a year earlier, many activists, and even Bolivia, the lone dissenting state, believed that it did not go far enough.⁵⁵ Despite widespread acceptance that the progress was too incremental, areas of progress were nonetheless acknowledged.⁵⁶

One area of progress was on “technology.”⁵⁷ Deliberations on creating a Technology Mechanism ramped up in the year leading up to COP 16, with an emphasis on including implementation capabilities.⁵⁸ At COP 16, the new proposed Technology Mechanism was under the agenda item on preparing an “outcome to be presented [at COP 16] to enable the full, effective and sustained *implementation* of the convention through long-term cooperative action.”⁵⁹ The proposed Technology Mechanism was to be “guided by a country-driven approach and be based on national circumstances and priorities” and made up of two bodies: a policy arm, the Technology Executive Committee (TEC), and critically, an implementation arm, the Climate Technology Centre and Network (CTCN).⁶⁰ The final agreed upon decision largely reflected the same language, although it added five areas that parties were to center dialogue on for the Technology Mechanism.⁶¹ These five areas included:

- (a) The relationship between the Technology Executive Committee and the Climate Technology Centre and Network, and their reporting lines;
- (b) The governance structure and terms of reference for the Climate Technology Centre and Network and how the Climate Technology Centre will relate to the Network, drawing upon the results of the workshop referred to in paragraph 129 below;
- (c) The procedure for calls for proposals and the criteria to be used to evaluate and select the host of the Climate Technology Centre and Network;
- (d) The potential links between the Technology Mechanism and the financial mechanism;

⁵³ Kate Sheppard, *Cancun climate breakthrough: It's not perfect, but it's a deal*, GRIST (Dec. 12, 2010) <https://grist.org/article/2010-12-11-cancun-climate-breakthrough-its-not-perfect-but-its-a-deal/> [<https://perma.cc/9EBX-2NZT>].

⁵⁴ *Id.*

⁵⁵ *Id.* (Two activists describe the agreement as an “inadequate response” and one that leaves “big political challenges” on the table. Bolivia’s objections cited the need for more to be required of “wealthy nations”).

⁵⁶ Rachel Mountain, *Can We Call the Cancun Agreements a Success?*, GREEN BIZ (Dec. 15, 2010) <https://www.greenbiz.com/article/can-we-call-cancun-agreements-success> [<https://perma.cc/4LBH-P5WA>].

⁵⁷ *Id.* (“In particular, the key areas of progress included provisions on . . . technology . . . and finance.”).

⁵⁸ *Id.* at 4 (The Expert Group on Technology Transfer, the predecessor of the Technology Mechanism established in 2001, received criticisms for its failure to address the implementation side of technology transfer and was the reason that it effectively ended at COP 16 in Cancun).

⁵⁹ United Nations, FCCC/AWGLCA/2010/16 (Nov. 11, 2010) (emphasis added).

⁶⁰ *Id.*

⁶¹ United Nations, FCCC/AWGLCA/2010/L.7.21 § 128 (Dec. 10, 2010).

(e) Consideration of additional functions for the Technology Executive Committee and the Climate Technology Centre and Network;⁶²

These five areas have largely shaped discussions of the Technology Mechanism since its creation and continue to do so.⁶³ Notably, the term “intellectual property” does not appear anywhere in the text establishing the Technology Mechanism, marking a quiet victory for developed countries.⁶⁴

C. Paris Agreements and the Technology Mechanism

Leading up to the 2015 COP 21 in Paris, once again the bulk of the attention was around producing a global agreement on reducing emissions and limiting the warming of the Earth.⁶⁵ COP 21 produced a “historic” agreement among nearly 200 countries, with many viewing the Paris Agreement as “the world’s most significant agreement to address climate change.”⁶⁶ The Paris Agreement committed signatories to take actions to keep global temperature rises below 1.5 degrees Celsius.⁶⁷ Notably, the Paris Agreement was legally binding on several aspects, including climate reporting and climate financing commitments from developed nations, contributing to the narrative of a “watershed moment in the world’s fight against climate change.”⁶⁸ Despite widespread praise, the Paris Agreement was not immune from criticism, including fears from less developed countries that the financial commitments would not be enough.⁶⁹

Along with the noted historic provisions, Article 10 of the agreement included noteworthy language pertaining to the Technology Mechanism.⁷⁰ While the six paragraphs on “technology

⁶² *Id.*

⁶³ See United Nations, FCCC/CP/2022/1/Add.2, at §2.9 (Nov. 6, 2022) (COP 27 included agenda items on a joint report of the TEC and CTCN, and on linkages of the Technology Mechanism and Financial Mechanism.).

⁶⁴ Khor, *supra* note 39, at 26.

⁶⁵ *Earth to Paris Summit Seeks Collective International Action Against Climate Change*, EGYPTIAN STREETS (Nov. 15, 2015), <https://egyptianstreets.com/2015/11/27/earth-to-paris-summit-seeks-collective-international-action-against-climate-change/> [<https://perma.cc/8RZ9-ZGEJ>] (“[COP 21] is crucial because the expected outcome is a new international agreement on climate change”); Agence France-Presse (ADP), *Barack Obama optimistic of reaching climate change deal at Paris summit*, THE GUARDIAN (Nov. 18, 2015), <https://www.theguardian.com/environment/2015/nov/18/barack-obama-optimistic-of-reaching-climate-change-deal-at-paris-summit> [<https://perma.cc/Z7DR-T2TY>] (“The goal of the climate summit in the French capital . . . is to forge a pact to reduce the greenhouse gas emissions that are blamed for global warming.”); See Ben Quinn, *COP21 climate marches in Paris not authorized following attacks*, THE GUARDIAN (Nov. 18, 2015), <https://www.theguardian.com/world/2015/nov/18/cop21-climate-marches-paris-attacks> [<https://perma.cc/PM4V-UKTM>] (COP21 also occurred soon after major terrorist attacks in Paris, which dominated discussions about security of the actual conference).

⁶⁶ Justin Worland, *What to Know About the Historic ‘Paris Agreement’ on Climate Change*, TIME (Dec. 12, 2015) <https://time.com/4146764/paris-agreement-climate-cop-21/> [<https://perma.cc/AJ9J-BCZU>].

⁶⁷ *Id.*

⁶⁸ John D. Sutter, *Hooray for the Paris climate agreement! Now What?*, CNN (Dec. 14, 2015) <https://www.cnn.com/2015/12/14/opinions/sutter-cop21-climate-5-things/index.html> [<https://perma.cc/4L6T-LSA4>].

⁶⁹ Fiona Harvey, *Paris climate change agreement: the world’s greatest diplomatic success*, THE GUARDIAN (Dec. 14, 2015), <https://www.theguardian.com/environment/2015/dec/13/paris-climate-deal-cop-diplomacy-developing-untied-nations> [<https://perma.cc/TT3E-WTCH>].

⁷⁰ *What is technology development and transfer?*, U.N. CLIMATE CHANGE (last visited Feb. 11, 2023), <https://unfccc.int/topics/what-is-technology-development-and-transfer> [<https://perma.cc/QY7H-GRBN>].

development and transfer” are broad, they provide substantial provisions that are meant to guide the work of the Technology Mechanism.⁷¹ This included several of the “areas” noted in the original establishment of the Technology Mechanism, such as collaboration with the Financial Mechanism.⁷² Overall, these provisions addressed criticisms of both the Technology Mechanism and UNFCCC’s work up to that point, regarding inadequate “technical and financial support through the UN multilateral process to help developing countries implement their own pledges.”⁷³

Perhaps the most impactful provision of Article 10 comes from the fourth paragraph, which calls for the UNFCCC to establish a “technology framework” for guiding the Technology Mechanism “in promoting and facilitating enhanced action on [climate] technology development and transfer in order to support the implementation of the Paris Agreement.”⁷⁴ The technology framework would ultimately be the key guidance principles that the Technology Mechanism relies upon in its work, including, “coherence, inclusiveness, transparency and results-orientated, transformational approaches.”⁷⁵

The UNFCCC adopted the final technology framework in 2018 at COP 24.⁷⁶ The technology framework is to “play a strategic role in improving the effectiveness . . . of the Technology Mechanism.”⁷⁷ It does so by focusing on five areas of action: “(a) Innovation; (b) Implementation; (c) Enabling environment and capacity-building; (d) Collaboration and stakeholder engagement; (e) Support.”⁷⁸ The framework lays out details for each one of these action areas that the Technology Mechanism is to work on, and the five areas have largely served as a means to organize the Technology Mechanism’s work into categories.⁷⁹ With the UNFCCC’s passage of the Technology Framework the full Technology Mechanism was given clear directives on what principles should guide its work.

Part II: Technology Mechanism at Work

Despite the Technology Mechanism’s current guiding framework not being passed until 2018, the Technology Mechanism began work in 2012. The Technology Mechanism is made up of two bodies: The Technology Executive Committee (TEC), focused on policy, and the Climate Technology Centre and Network (CTCN), focused on implementation.⁸⁰ Together, these two

⁷¹ Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104, at Article 10.1, 10.4.

⁷² *Id.* at 10.5.

⁷³ Ambuj D. Sagar, *On climate, developing countries need more than betting billions on clean energy breakthroughs*, THE CONVERSATION (Dec. 10, 2015), <https://theconversation.com/on-climate-developing-countries-need-more-than-betting-billions-on-clean-energy-breakthroughs-51972> [<https://perma.cc/AZW7-QWZR>].

⁷⁴ Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104, at 10.4.

⁷⁵ Nicolea Sherman, *Inter-State climate technology transfer under the UNFCCC: A benefit-sharing approach*, 31(3) RECIEL 435, 439 (Nov. 2022).

⁷⁶ UNFCCC, *Decision 15/CMA.1, Technology Framework under Article 10, Paragraph 4, of the Paris Agreement*, UN Doc FCCC/PA/CMA/2018/3/Add.2 (March 19, 2019).

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Support: Support for Implementing Climate Technology Activities*, UNFCCC, <https://unfccc.int/ttclear/support/technology-mechanism.html> [<https://perma.cc/7BZT-EXM3>] (last visited March 7, 2023).

bodies work to enhance climate technology in developing countries, with the UNFCCC making several efforts to increase collaboration and effectiveness between the two bodies.⁸¹

A. Technology Executive Committee – Policy

The TEC is the official policy body of the Technology Mechanism and is composed of twenty climate technology experts from developed and developing countries.⁸² The overall focus of the TEC is to identify “policies that can accelerate the development and transfer of low-emission and climate resilient technologies.”⁸³ The TEC does this by developing key messages and recommendations on climate technology policy.⁸⁴ The TEC reports on these activities annually at the COP, beginning with COP 18 in 2012 where it provided several “key messages on enabling environments for and barriers to technology development and transfer, technology road maps and technology needs assessments.”⁸⁵ The TEC also periodically publishes briefs on various policy topics relating to improving technology transfer, with its first such brief coming in 2013.⁸⁶ Since 2019, the TEC has operated under a four-year rolling work plan for 2019-2022, guided by the five areas established by the technology framework in the Paris Agreement: Innovation, implementation, enabling environments and capacity-building, collaboration and stakeholder engagement, and support.⁸⁷

Under the “innovation” umbrella, the TEC focuses on policies promoting innovation and research, design, and development work addressing adaptation and mitigation.⁸⁸ Here, TEC produces deliverables such as recommendations at COP 26 on “international collaborative [research, development and demonstration],” a paper on “emerging climate technologies in the energy supply sector,” and participation in various climate technology events across the world to promote innovative policy approaches to climate technology development in developing countries.⁸⁹

⁸¹ *Id.*; *Technology Mechanism Work Programme Launched at COP 27*, INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT (Nov. 16, 2022), <https://sdg.iisd.org/news/technology-mechanism-work-programme-launched-at-cop-27/#:~:text=The%20UNFCCC%20launched%20the%20first,impact%20of%20the%20Technology%20Mechanism> [<https://perma.cc/JJX9-WSRB>].

⁸² *Technology Executive Committee*, TT:CLEAR (Last visited Feb. 16, 2023), <https://unfccc.int/ttclear/tec> [<https://perma.cc/2DTK-MVN9>].

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ UNFCC, *Report on activities and performance of the Technology Executive Committee for 2012, Summary*, U.N. Doc. GE.12-62996 (Oct. 18, 2012), <https://unfccc.int/resource/docs/2012/sb/eng/02.pdf#page=8> [<https://perma.cc/B7RC-BCAY>].

⁸⁶ See Technology Executive Committee, *Using roadmapping to facilitate the planning and implementation of technologies for mitigation and adaptation*, UNFCC (2013), https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_column_L/3aaf07d4cf1d4d51998b57771759880a/f427db90b3c54f2d979f984db5af18ce.pdf [<https://perma.cc/FE8U-CZSL>].

⁸⁷ *Id.*

⁸⁸ UNFCC, *Technology Executive Committee: Impact, Performance and Activities*, TT:CLEAR, <https://unfccc.int/ttclear/tec/archive2019-22.html> [<https://perma.cc/59VB-SYAJ>] (last visited March 10, 2023).

⁸⁹ *Id.*

Under “implementation,” TEC focuses on highlighting policies and practices that improve the implementation of technology transfer through various structural assessments and reporting mechanisms.⁹⁰ These efforts have primarily centered around developing and improving tools such as nationally determined contributions (NDCs), technical needs assessments (TNAs), and national adaptation plans (NAPs).⁹¹ NDCs are national climate plans set by each developing country that establish climate related targets as well as policies aimed to implement actions that will help to reach those targets.⁹² TNAs originate from a COP 7 decision in 2001 that encouraged developing countries to “undertake assessments of country-specific technology needs.”⁹³ These assessments identify technologies that should be prioritized by the developing country and barriers to implementation of these technologies, before creating an action plan to work towards implementing the technologies.⁹⁴ Finally, the UNFCCC developed NAPs at COP 16 in Cancun.⁹⁵ NAPs identify developing countries’ “medium- and long-term adaptation needs” and develop and implement strategies and programmes to address those needs in developing countries.⁹⁶ Notably, all of these tools are all drafted and implemented by the developing country. Thus, through this focus area, TEC seeks to put forth policies that can improve tools that help developing countries better implement climate technology.⁹⁷

Through the “enabling environment and capacity-building” focus area, TEC works to promote and develop policies that countries can adopt to create regulatory environments that make the adoption of climate friendly technologies easier.⁹⁸ The TEC also focuses on policies that generally improve developing countries capacity to adopt these technologies.⁹⁹ The TEC’s work here has included a report broadly identifying barriers to capacity building, and a report on specific solutions for “sustainable road mobility.”¹⁰⁰ Under “collaboration and stakeholders engagement,” the TEC partners with outside NGOs and experts to publish reports and give recommendations on a variety of topics within the Technology Mechanism’s framework.¹⁰¹ This involves several “joint policy briefs” and joint presentations with experts at COP and other conferences throughout the year.¹⁰²

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² *NDC Spotlight: Introduction*, UNITED NATIONS CLIMATE CHANGE, <https://unfccc.int/process/the-paris-agreement/nationally-determined-contributions/ndc-spotlight> [<https://perma.cc/RRJ6-2HYB>] (last visited March 10, 2023).

⁹³ *Policy brief on linkages between technology needs assessment process and nationally determined contributions process*, 15 TEC BRIEF 1, 5 (June 2022), https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_documents/c0cb662d56f54fef8e53d0d1838fa2d7/de6da9e857d145fdbd5b8c2be66fcd26.pdf [<https://perma.cc/8TLT-MRBX>].

⁹⁴ *Id.*

⁹⁵ *National Adaptation Plans*, UNITED NATIONS CLIMATE CHANGE, https://unfccc.int/topics/adaptation-and-resilience/workstreams/national-adaptation-plans?psafe_param=1&gclid=Cj0KCQiAx6ugBhCcARIsAGNmMbjcCoSoA44XKVs7uUsalvB-xMzFWQoSAP9-BRS680BZo3xz-o3QyukaAkiHEALw_wcB [<https://perma.cc/ZKZ3-CEJQ>] (last visited March 10, 2023).

⁹⁶ *Id.*

⁹⁷ Adebayo Majekolagbe, *A Performance Analysis of the International Environmentally Sound Technology Transfer Framework in Africa*, 15 MCGILL J. SUST. DEV. L. 87, 125 (2020).

⁹⁸ *Tech. Exec. Comm.: Impact, Performance and Activities*, TT: CLEAR, <https://unfccc.int/ttclear/tec/impact.html> [<https://perma.cc/66US-L8G7>] (last visited March 10, 2023).

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² *Id.*

Finally, through “support,” the TEC focusses on the role that other UNFCCC bodies have in technology transfer.¹⁰³ Here, the TEC focusses on bodies such as the Financial Mechanism and its operating entities, as well as other UNFCCC entities that also affect and support the work of the Technology Mechanism.¹⁰⁴ This area is of particular significance, as calls for increased linkages between the Technology Mechanism and the Financial Mechanism, and calls for increased overall funding to the Technology Mechanism continue.¹⁰⁵ Here, the TEC provides recommendations to these other bodies, with an eye towards supporting the Technology Mechanism’s work.¹⁰⁶

Thus, while the work that the TEC has been engaged in since the establishment of the technology framework in Paris has been organized into these five areas, the work has been expansive, covering a variety of topics, all with the common goal of improving the transfer of technology to developing countries.¹⁰⁷ The work that the TEC has been engaged in, while useful, is not new. Rather, its role of policy recommendations pertaining to technology transfer are largely an extension of Technology Mechanism precursors that exclusively focused on policy, with no implementation role.¹⁰⁸ The Technology Mechanism’s other body, however, takes up this task of implementation.

B. Climate Technology Centre and Network – Implementation

The Climate Technology Centre and Network (CTCN) is the implementation arm of the Technology Mechanism.¹⁰⁹ Broadly, The CTCN works to accelerate the transfer and development of climate technology at the request of developing countries to lower their carbon emissions and bolster their climate resilience.¹¹⁰ The CTCN is overseen by its own Advisory Board of 30

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ Wash. Post Staff, *The Glasgow climate pact, annotated*, WASHINGTON POST (Nov. 13, 2021), <https://www.washingtonpost.com/climate-environment/interactive/2021/glasgow-climate-pact-full-text-cop26/> [<https://perma.cc/SE9P-R5M3>] (“*Emphasizes* the importance of strengthening cooperative action on technology development and transfer for the implementation of mitigation and adaptation action, including accelerating, encouraging and enabling innovation, and the importance of predictable, sustainable and adequate funding from diverse sources for the Technology Mechanism.”).

¹⁰⁶ See Report on the 23rd meeting of the Technology Executive Committee at 13-16, U.N. Doc. TEC/2021/23/21 (Oct. 21, 2021) (Annex V on “Inputs by the Technology Executive Committee to the draft guidance for the operating entities of the Financial Mechanism,” provides nine detailed recommendations to the Financial Mechanism.).

¹⁰⁷ See *Technology Executive Committee: Impact, Performance and Activities*, TT:CLEAR, <https://unfccc.int/ttclear/tec/impact.html> (last visited March 10, 2023) (The TEC has published briefs on improving structural tools such as TNAs and NDCs (TEC Brief #15), while also publishing materials on specific technologies for specific sustainability efforts, such as the technical paper on “Deep decarbonization Technologies for Sustainable Road Mobility.”).

¹⁰⁸ Majekolagbe, *supra* note 17, at 124, 126 (The EGTT made progress on policy issues, such as improving TNAs and increasing linkages with technology and Financial Mechanism but was ultimately terminated due to “dissatisfaction with its non-implementation role.”).

¹⁰⁹ Climate Tech. Centre and Network, CLIMATE TECH. AND NETWORK, <https://www.ctc-n.org/> [<https://perma.cc/4SVA-8R9C>] (last visited March 10, 2023).

¹¹⁰ *What we do*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/about-ctcn/what-we-do> [<https://perma.cc/RUD9-39UY>] (last visited March 10, 2023).

members from developed and developing countries, as well as representatives of non-state constituencies.¹¹¹ The Advisory Board meets at least twice a year and determines the CTCN's operations and procedural rules based on its authority as established in COP 16.¹¹² The CTCN's work is funded through bilateral and multilateral donations from countries and other U.N. bodies.¹¹³

The CTCN works through its two parts: Its "Centre" and its "Network."¹¹⁴ The Centre, headquartered in Copenhagen, is the actual body of the CTCN which includes its staff that coordinate projects and work that the CTCN engages in.¹¹⁵ The Network on the other hand is a large, diverse group of hundreds of member institutions including "research, academic, financial, non-governmental, [or] private sector or public sector organization," that apply and are accepted into the Network.¹¹⁶ The Network also includes over 150 National Designated Entities (NDEs), which are entities selected by each country to manage their requests to the CTCN.¹¹⁷ The CTCN provides three core services: Technical assistance, information exchange, and capacity building.¹¹⁸ These services are administered by the Centre which connects developing countries' technical assistance proposals to Network members, coordinates workshops on technology development from Network members, and provides information on technology development from Network members around the world.¹¹⁹

i. CTCN Technical Assistance

The CTCN's technical assistance work connects developing countries to its vast Network of climate technology experts.¹²⁰ The technical assistance generally takes one of five forms.¹²¹ The first is technical assessments, which include "expertise and recommendations related to specific technology needs, identification of technologies, technology barriers, technology efficiency, as well as piloting and deployment of technologies."¹²² The other forms of technical assistance include providing hands-on technical support to developing countries for policy and planning documents, trainings, tools and methodologies, and implementation plans.¹²³ The overall goal of any form of technical assistance is to aid developing countries with either adaptation, mitigation,

¹¹¹ *Advisory Board*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/about-ctcn/advisory-board> [https://perma.cc/M77A-4W9H] (last visited March 10, 2023).

¹¹² *Id.*

¹¹³ Chaewoon Oh, *Evaluation of the UNFCCC Technology Mechanism's contribution to an international climate policy framework*, 22 INTERNATIONAL ENV'T AGREEMENTS: POLITICS, LAW AND ECONOMICS 527, 539 (2022).

¹¹⁴ *About the Climate Technology Centre and Network (CTCN)*, CLIMATE TECHNOLOGY CENTRE AND NETWORK, <https://www.ctc-n.org/about-ctcn> [https://perma.cc/GQ2J-JJBC] (last visited March 10, 2023).

¹¹⁵ *Id.*

¹¹⁶ *Id.*; *Join the Network*, CLIMATE TECH. TECHNOLOGY CENTRE AND NETWORK, <https://www.ctc-n.org/network/join-network> [https://perma.cc/LK3S-M446] (last visited May 19, 2023).

¹¹⁷ *Join the Network*, *supra* note 116.

¹¹⁸ *About the Climate Technology Centre and Network*, *supra* note 114.

¹¹⁹ *Network*, CLIMATE TECH CENTRE AND NETWORK, <https://www.ctc-n.org/network> [https://perma.cc/7G76-KY49] (last visited March 10, 2023).

¹²⁰ *Technical Assistance*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/technical-assistance> [https://perma.cc/N7PH-5P6X] (last visited March 10, 2023).

¹²¹ *Id.*

¹²² *Id.*

¹²³ *Id.*

or a combination of both.¹²⁴ In all, developing countries and their NDEs are able to receive up to \$250,000 worth of services for a project that covers a “broad range of adaptation and mitigation technologies,” all at no cost to them.¹²⁵

Both developed and developing countries assign an NDE that manages their requests to the CTCN.¹²⁶ Designation of an NDE is required for a country to participate in the CTCN technical assistance process.¹²⁷ NDEs are almost exclusively government entities, such as the United States' State Department and Saudi Arabia's Ministry of Petroleum and Mineral Resources, and the few that are not, such as Botswana's Institute for Technology Research, are still overseen and affiliated with the government in which they represent.¹²⁸ Developing country NDEs work with both private and public actors to identify the technical assistance needed to implement technology-related climate plans before submitting requests to the CTCN.¹²⁹ Once the request is accepted, experts from the CTCN work with the NDE to provide a solution specific to the needs of that developing country.¹³⁰ In doing this, members of the Network are selected through a competitive bidding process.¹³¹ The role of NDE's from developed countries is less clear,¹³² but generally, they are encouraged to report to the CTCN on how their country may be of assistance in improving technology transfer.¹³³ Bolstering and clarifying the role of developed country-NDE's has been an area that the CTCN and the broader Technology Mechanism have looked to improve.¹³⁴

The CTCN officially opened on November 21, 2013.¹³⁵ Less than six months later it granted its first request for technical assistance in which Chile requested assistance in designing a national biodiversity monitoring network that would monitor the impacts of climate change.¹³⁶ The CTCN partnered with the Tropical Agricultural Research and Higher Education Center and World Agroforestry Centre to assist Chile's Ministry of Environment in designing a national biodiversity

¹²⁴ See *Active Technical Assistance*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/technical-assistance/data> [<https://perma.cc/TV3Q-UWLS>] (last visited March 12, 2023).

¹²⁵ *Technical Assistance*, *supra* note 120.

¹²⁶ *Designated Entities*, CLIMATE TECHNOLOGY CENTRE AND NETWORK, <https://www.ctc-n.org/about-ctcn/national-designated-entities> [<https://perma.cc/M4V5-TQRP>] (last visited March 10, 2023).

¹²⁷ *Id.*

¹²⁸ *National Designated Entities by country*, TT: CLEAR, <https://unfccc.int/ttclear/support/national-designated-entity.html> [<https://perma.cc/FE73-NNGK>] (last visited March 10, 2023); *Governance Structure*, BOTSWANA INSTITUTE FOR TECHNOLOGY RESEARCH AND INNOVATION, <https://www.bitri.co.bw/governance-structure/> [<https://perma.cc/WH7M-ZM6B>] (“BITRI is [a parastatal] run by a Board of Directors each . . . appointed by the Minister of Tertiary Education, Research, Science and Technology.”) (last visited March 12, 2023).

¹²⁹ *Technical Assistance*, *supra* note 120.

¹³⁰ *Id.*

¹³¹ *Network*, *supra* note 119.

¹³² See *Annex 1 National Designated Entities (NDEs) for the CTCN*, CLIMATE TECH. CENTRE AND NETWORK, https://www.ctc-n.org/sites/www.ctc-n.org/files/annex_1_national_designated_entities_-_roles_and_responsibilities.pdf [<https://perma.cc/K6PT-3JWT>] (last visited April 20, 2023).

¹³³ *Strengthening National Systems of Innovation to Enhance Action on Climate Change*, 7 TEC BRIEF 1, 2, 11 (November 2015).

¹³⁴ *Annex 1 National Designated Entities*, *supra* note 132.

¹³⁵ *At climate change talks, Ban stresses major role of cities in mitigating impact*, U.N. NEWS (Nov. 21, 2013), <https://news.un.org/en/story/2013/11/455982> [<https://perma.cc/75DD-T47H>].

¹³⁶ See *Active Technical Assistance*, *supra* note 124.

monitoring network.¹³⁷ This included conceptual designs of a national monitoring network for biodiversity and ecosystems as well as a proposal for institutional arrangements for implementation of the network.¹³⁸ The CTCN and its partners completed the project in 2016, making Chile one of the first countries to complete a technology transfer.¹³⁹

Despite the efforts of the CTCN on this project, progress on biodiversity efforts in Chile have been slow. In 2014, a few months after its submission to the CTCN, Chile's government submitted draft legislation proposing the establishment of a Biodiversity and Protected Area Service (SBAP), which would tackle many of the goals of the CTCN's technology transfer surrounding improving regulatory efficiency and barriers to improving biodiversity.¹⁴⁰ As of March 2023, the bill remains pending in the Chilean legislature, despite commitments in both 2022 and 2023 from Chile's environment minister, Maisa Rojas, to pass the legislation.¹⁴¹ Despite this delay, Chile has seen improvement on biodiversity, shown most recently by the launch of "Fondo Naturaleza Chile" by Rojas, which is a public-private partnership that will fund biodiversity conservation efforts throughout Chile.¹⁴² Further, while the SBAP has yet to be officially implemented, the Chilean legislature did make progress on implementation in 2022.¹⁴³ Thus, although the progress in Chile has been slow, this early project shows that the CTCN can aid in producing positive results.

One of the most recent technical assistance projects to be completed by the CTCN further highlights the success and further potential of the CTCN while also highlighting a potential shortcoming. On January 31, 2021, Burundi's NDE, Institut Géographique du Burundi, submitted a proposal for technical assistance in implementing a small pilot project to identify and implement a "low-cost, climate resilient, re-usable, easy replicable, scalable and mobile flood barrier" to prevent flooding damage and curb water scarcity during droughts.¹⁴⁴ Importantly, Burundi is an

¹³⁷ *Design of a National Network for Monitoring Ecosystem Resilience in the Face of Climate Change*, CLIMATE TECH. CENTRE AND NETWORK (Feb. 21, 2014), <https://www.ctc-n.org/technical-assistance/projects/design-national-network-monitoring-ecosystem-resilience-face-climate> [<https://perma.cc/XXM5-UL2M>].

¹³⁸ *Id.*

¹³⁹ *CTCN Publication in Spanish: Design of a Biodiversity Monitoring Network in Chile*, CLIMATE TECH. CENTRE AND NETWORK (May 19, 2016), <https://www.ctc-n.org/news/ctcn-publication-spanish-design-biodiversity-monitoring-network-chile> [<https://perma.cc/A9XU-WPYJ>].

¹⁴⁰ See OECD/ECLAC, *OECD Environmental Performance Reviews: Chile 2016*, OECD ENV'T PERFORMANCE REVIEWS (2016), <https://doi.org/10.1787/9789264252615-en> [<https://perma.cc/28WY-PG6P>] ("The bill aims to reduce institutional fragmentation; improve the co-ordination, efficiency and effectiveness of biodiversity policy; increase participation of the private sector and the public in policy development and implementation; and, ultimately, to help achieve the country's international commitments."). See also *Design of a National Network for Monitoring Ecosystem Resilience in the Face of Climate Change*, CLIMATE TECH. CENTRE AND NETWORK (Feb. 21, 2014), <https://www.ctc-n.org/technical-assistance/projects/design-national-network-monitoring-ecosystem-resilience-face-climate> [<https://perma.cc/5RNL-LDKW>] ("The collaboration . . . resulted in . . . [a] proposal for the formal institutional arrangements and alliances as well as logistical, operational and financial requirements for network implementation.").

¹⁴¹ Caterinna Giovannini, *Chile launches a national nature fund*, PATAGON JOURNAL (April 5, 2022), https://www.patagonjournal.com/index.php?option=com_content&view=article&id=4399%3Achile-launches-a-national-nature-fund&catid=190%3Aconservation&Itemid=385&lang=en [<https://perma.cc/F678-XUQB>].

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Easily deployable water-filled flood barrier that can be used to prevent damage from flooding and to store water vapor-tight to ensure water availability in times of drought*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/content/easily-deployable-water-filled-flood-barrier-can-be-used-prevent-damage-flooding-and-store> [<https://perma.cc/B6Y4-AQVZ>] (last visited March 12, 2023).

LDC that ranks as the 14th most vulnerable country to climate change and is the 17th least ready country in the world to deal with the effect of climate change.¹⁴⁵

Burundi suffered two devastating floods around the time it submitted its request to the CTCN. In April 2020, Gatumba, an agricultural village in Burundi, suffered a flood that resulted in 90 percent of its population losing their belongings when the Ruzizi River overflowed following heavy rains.¹⁴⁶ These floods left thousands without access to water, sanitation, and hygiene services.¹⁴⁷ One year later, the Ruzizi River flooded once again when heavy rainfall began downstream in and around Lake Tanganyika, the second deepest lake in the world, forcing the government to call for the evacuation of nearly another 10,000 Burundians living around the lake and the river.¹⁴⁸ Later in 2021, it was estimated that natural disasters had displaced over 100,000 Burundians in recent years, with a key cause of this being climate change making rain more likely.¹⁴⁹

Thus, Burundi's proposal to the CTCN was timely and the stakes were high. The pilot project targeted a community in Musenyi, Burundi to the north of Lake Tanganyika.¹⁵⁰ The technical assistance to developing the pilot project was done by two foreign consulting firms, one from Netherlands and one from New Zealand, as well as a Burundi-based organization focused on protecting Burundi's natural resources.¹⁵¹ The technical assistance ended after about seven months and delivered support on flood hazard mapping, flood forecasting system, disaster preparedness plans, and floodplain zoning, in addition to recommending and laying out plans for the scaling up of water-filled barriers against flooding across Burundi.¹⁵²

Ultimately, the CTCN and its partners provided technical assistance to deploy and demonstrate the use of SLAMDAM, a water-filled rubber flood barrier that also stores water that can be used later during a drought.¹⁵³ Following the completion of the CTCN's technology transfer and positive feedback from Burundian participants, Burundi made plans to scale up the use of SLAMDAM to larger areas and a larger population.¹⁵⁴ Notably, the cost of installing the SLAMDAM was "very cheap" with the CTCN's budget totaling less than \$400, an important point given that the CTCN does not provide direct funding to developing countries.¹⁵⁵ Thus, the

¹⁴⁵ *Id.*

¹⁴⁶ Zineb Boujrada, *The Gatumba Floods in Burundi*, UNICEF (April 29, 2020), <https://www.unicef.org/burundi/stories/gatumba-floods-burundi> [<https://perma.cc/AAQ2-KV7R>].

¹⁴⁷ *Id.*

¹⁴⁸ *Final Report: Burundi: Floods and Landslides April 2021 Final Report*, INT'L FEDERATION OF RED CROSS AND RED CRESCENT SOCIETIES (March 17, 2022) [on file with author].

¹⁴⁹ *Burundi floods: Lake Tanganyika's water levels rise*, BBC NEWS (Sept. 20, 2021), <https://www.bbc.com/news/world-africa-58614677> [<https://perma.cc/JJ7F-BRCQ>].

¹⁵⁰ *Easily deployable water-filled flood*, *supra* note 144.

¹⁵¹ Closure Report for Technical Assistance: Flood and drought damage prevention with SLAMDAM, CLIMATE TECH. CENTRE AND NETWORK (2022), https://www.ctc-n.org/system/files/dossier/3b/B.%20TA_closure%20report_template_SLAMDAM%20%28FINAL%29.pdf [<https://perma.cc/8FPF-SVKN>].

¹⁵² *Id.* at 2.

¹⁵³ *Id.*

¹⁵⁴ *Can this portable dam help Africa counter rising waters?*, U.N. ENV'T PROGRAMME (Sept. 8, 2022), <https://www.unep.org/news-and-stories/story/can-portable-dam-help-africa-counter-rising-waters> [<https://perma.cc/X9P3-6RFX>].

¹⁵⁵ *Id.*; *Technical Assistance*, *supra* note 120.

CTCN's Burundi SLAMDAM project was viewed as an initial success. However, a point of criticism of CTCN technical assistance projects has been the lack of follow-up after projects conclude.¹⁵⁶ Therefore, as floodings continue to ravish Burundi and displace thousands of Burundians,¹⁵⁷ efforts to scale up the successful pilot project will make or break the "success" of the CTCN's assistance.¹⁵⁸

In addition to these two technical assistance projects, the CTCN has completed over 387 technical assistance requests through the end of 2022.¹⁵⁹ These projects have touched a variety of different environmental-related sectors, including energy, agriculture, transportation, and infrastructure and urban planning.¹⁶⁰ Further, a number of developing nations have already benefited from the CTCN's technical assistance work several times, with the Ivory Coast having a total of nine proposals approved and multiple other countries having had eight approved proposals through the end of 2022.¹⁶¹ Despite the large number of completed projects, only approximately 50 involved assistance to LDCs.¹⁶² Thus, despite LDCs accounting for nearly a third of all developing countries, they represent less than a seventh of the beneficiaries from completed CTCN technical assistance projects.¹⁶³

ii. CTCN's Other Work

Despite a large focus on the CTCN's technical assistance services, the body also provides implementation-focused work on capacity building and information exchange.¹⁶⁴ On capacity building, the CTCN facilitates the provision of information, training, and support to improve developing countries' abilities to make climate technology decisions as well as build up and maintain climate technology on their own.¹⁶⁵ It has several capacity building programs that help accomplish this, including its Incubator Programme and several other programs that work to train youth in LDCs, expose Network members to CTCN work, and Regional Forums that foster collaboration among Network members from across the world.¹⁶⁶

¹⁵⁶ *First periodic assessment of the effectiveness and adequacy of the support provided to the Technology Mechanism in supporting the implementation on matters relating to technology development and transfer*, U.N. Doc. FCCC/SBI/2022/13, at 7 (Sep. 5, 2022).

¹⁵⁷ Richard Davies, *Burundi – Damage and Fatalities After Floods in 4 Provinces*, FLOODLIST (April 7, 2023), <https://floodlist.com/africa/burundi-rwanda-floods-april-2023> [<https://perma.cc/P3VG-N7UL>].

¹⁵⁸ Arame Tall & Nfamara Dampha, *Burundi: Scaling up Climate Resilience in the Land of 3,000 Hills*, WORLD BANK (March 28, 2023), <https://blogs.worldbank.org/africacan/burundi-scaling-climate-resilience-land-3000-hills> [<https://perma.cc/GUY8-YX85>].

¹⁵⁹ *Request visualizations*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/technical-assistance/request-visualizations> (March 2023).

¹⁶⁰ *Active Technical Assistance*, *supra* note 124.

¹⁶¹ *Id.*

¹⁶² *Id.* (filtered results to only LDCs, showing 50 completed proposals).

¹⁶³ *Parties to the United Nations Framework Convention on Climate Change*, U.N. CLIMATE CHANGE, <https://unfccc.int/process/parties-non-party-stakeholders/parties-convention-and-observer-states> [<https://perma.cc/TS8N-GSXD>] (Oct. 25, 2022) (Listing 155 Non-Annex I parties); *UN list of least developed countries*, U.N. CONFERENCE ON TRADE AND DEV. (October 2022), <https://unctad.org/topic/least-developed-countries/list#:~:text=There%20are%20currently%2046%20economies,on%20technology%20among%20other%20concessions> [<https://perma.cc/UYL2-288N>].

¹⁶⁴ *Network*, *supra* note 119.

¹⁶⁵ *Capacity Building*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/capacity-building> [<https://perma.cc/8E9D-QJTU>] (last visited March 12, 2023).

¹⁶⁶ *Id.*

The Incubator Programme is the most hands-on capacity building work that the CTCN engages in.¹⁶⁷ Here, the CTCN works specifically with LDCs to implement the climate actions laid out in their individual NDCs.¹⁶⁸ The CTCN works with the LDC to create a Technology Roadmap that “assesses feasibility, develops business and financial models for bankable projects and prepares for investment,” with the greater purpose of strengthening the LDCs’ institutional capacity to achieve the climate technology targets in its NDCs.¹⁶⁹ Thus, similar to the CTCN’s technical assistance program, this work simply helps LDCs be better prepared to implement climate technology in their country themselves, albeit on a broader level that is less focused on specific technology.

The majority of the remaining capacity building and information sharing work that the CTCN is engaged in is eerily similar to the TECs work in that the work takes the form of reports, presentations, and other educational measures that are focused on improving implementation capabilities.¹⁷⁰ Overall, the work of the CTCN is robust and much more hands-on than that of the TEC, which should be expected of a body focused on implementing technology transfer goals.

Part III: Criticisms of the Technology Mechanism and Areas for Improvement

In looking at the effectiveness of the Technology Mechanism as a whole, most of the discussion focuses on the CTCN. This makes sense, as it took nearly twenty years just to establish a technology mechanism with actual implementation power. Now, the CTCN has been operating for roughly a decade, completing hundreds of technology transfer implementation projects, predominantly centered on providing technical assistance to developing countries. Two common issues that stakeholders raise with the CTCN are insufficient funding and the mere offering of technical support not being enough.¹⁷¹

Criticisms of money and the CTCN come from several angles. First, the budget of the CTCN’s technical assistance program is relatively low. In 2020, the CTCN spent \$6,734,100 on technical assistance.¹⁷² When compared to other UNFCCC efforts, such as the \$79.6 billion raised for climate finance, \$16.7 billion of which came in the form of grants, CTCN expenditures look like a drop in the bucket.¹⁷³

As mentioned, the CTCN is funded through bilateral and multilateral donations.¹⁷⁴ Since it began in 2013, the CTCN has received a total of \$107,557,040.¹⁷⁵ This includes \$88,145,636 from

¹⁶⁷ *Incubator Programme*, CLIMATE TECH. CENTRE AND NETWORK, <https://www.ctc-n.org/capacity-building/incubator-programme> [<https://perma.cc/KCR9-94BG>] (last visited March 12, 2023).

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

¹⁷⁰ *About the Climate Technology Centre and Network*, *supra* note 114.

¹⁷¹ *Oh*, *supra* note 113, at 529.

¹⁷² *Id.* at 534.

¹⁷³ Elena Ares & Philip Loft, *COP26: Delivering on \$100 billion climate finance*, UK PARLIAMENT HOUSE OF COMMONS LIBRARY (Nov. 3, 2021), <https://commonslibrary.parliament.uk/cop26-delivering-on-100-billion-climate-finance/> [<https://perma.cc/5SBZ-JQCT>].

¹⁷⁴ *Oh*, *supra* note 113, at 539.

¹⁷⁵ *Donors of the CTCN*, CLIMATE TECH CENTRE AND NETWORK, <https://www.ctc-n.org/about-ctcn/donors#:~:text=The%20work%20of%20the%20CTCN%20is%20supported%20by%20voluntary%20contributions> [<https://perma.cc/C8VK-PLC6>] (last visited March 12, 2023).

the European Union and a host of developed countries as well as \$19,411,404 from other UNFCCC bodies including, the Adaptation Fund, Green Climate Fund, Global Environmental Facility, and the U.N. Industrial Development Organization.¹⁷⁶ This translates to an average of slightly under \$10 million a year for the CTCN, although the level for any particular year varies due to the lack of any obligated or recurring funding.¹⁷⁷ This lower level of funding and its inconsistent nature have been the topic of criticism, with calls to produce stable and reliable funding sources.¹⁷⁸ To put the funding of the CTCN into context, over its first four years of operation, it received a total of \$38,470,000, which is less than half of the money spent on building an art museum around the same time in Dundee, Scotland.¹⁷⁹

In addition to insufficient levels of funding, the dominant funding form of one-time donations has also been subject to criticism. The lack of obligated or recurring funding has widely been cited as a significant limitation to the work of the CTCN and Technology Mechanism. Stakeholders have cited the inconsistent nature of these grants as “unsustainable,” creating “financial instability” for the CTCN.¹⁸⁰ This instability is a barrier to the CTCN achieving its goals of implementing climate technology in developing countries due to the uncertainty of the level of services it will be able to provide year-to-year.¹⁸¹

Closely linked to the criticisms on CTCN funding are criticisms of how the CTCN carries out its work. Here, a large focus is on whether technical assistance alone is enough, and whether the current structure of the CTCN is conducive for getting developing countries the climate technology they need.¹⁸² The desire for more than technical assistance is older than the Technology Mechanism itself. Early debates on sharing intellectual property stemmed from a desire for more than technical assistance.¹⁸³ Developing countries wanted access to intellectual property from developed countries and the private industry so that they would be able to implement the climate technologies themselves.¹⁸⁴ While discussions on intellectual property have largely subsided, the desire to get more out of the Technology Mechanism remains.

The viability of technical assistance alone also stems from concerns that many countries may not have the means to complete projects absent funding to go along with it.¹⁸⁵ Since the CTCN does not provide actual funding to the developing countries, the countries must use private funds or put up their own money.¹⁸⁶ This has especially been a disadvantage to many African countries, who make up the overwhelming majority of LDCs,¹⁸⁷ due to struggles to “attract

¹⁷⁶ *Id.* (While South Korea is now a developed country, they are the lone non-annex I country that donates to the CTCN).

¹⁷⁷ Oh, *supra* note 113, at 538.

¹⁷⁸ *Id.*; Adebayo Majekolagbe, *supra* note 97, at 126, 128. (“The CTCN’s core need, according to its 2017 independent review, for instance, is a predictable and properly structured mode of funding which will allow for medium- and long-term planning.”).

¹⁷⁹ Sullivan, *supra* note 26, at 17.

¹⁸⁰ Oh, *supra* note 113, at 538.

¹⁸¹ Sullivan, *supra* note 27, at 17.

¹⁸² Majekolagbe, *supra* note 97, at 124–25.

¹⁸³ See Khor, *supra* note 39, at 21–25.

¹⁸⁴ *Id.* at 21, 25.

¹⁸⁵ Majekolagbe, *supra* note 97, at 123–24.

¹⁸⁶ *Id.* at 123.

¹⁸⁷ André-Michel Essoungou, *Africa’s lease developed: lands of opportunity*, AFRICA RENEWAL (August 2011), <https://www.un.org/africarenewal/magazine/august-2011/africas-least-developed-lands-opportunity#:~:text=Africa's%20group%20of%2033,countries%20have%20dominated%20the%20list> [https://perma.cc/K9MU-JTJ3].

investments or financial backing” for climate technology projects.¹⁸⁸ Here, one solution proposed by developing countries is a solid linkage between the CTCN and the Financial Mechanism.¹⁸⁹

Broadly, the Financial Mechanism does exactly what the CTCN and Technology Mechanism explicitly do not “provide financial resources to developing countries.”¹⁹⁰ The Financial Mechanism largely represents the potential to provide direct funding to developing countries to support climate technology efforts. This support primarily comes from the operating entities of the Financial Mechanism, the Green Climate Fund (GCF)¹⁹¹ and Global Environment Facility (GEF)¹⁹², as well as the Adaptation Fund, which specifically funds projects focused on adaptation to changes brought by climate change.¹⁹³ Specifically, many of the projects that the CTCN provides technical assistance to involve helping these countries apply for funding from these Financial Mechanism entities.¹⁹⁴ However, these applications are considered alongside a host of other projects, and the GCF, GEF, and Adaptation Fund do not prioritize CTCN-backed projects over others. While there has been progress in increasing collaboration between the Financial Mechanism and the CTCN, there continues to be a desire for more.

The GEF, GCF, and Adaptation Fund also contribute directly to the CTCN's yearly budget. In 2022 the Adaptation Fund contributed \$2,016,471 to the CTCN's budget as part of a pledge it made in 2020.¹⁹⁵ The GEF and the GCF contributed \$741,315 and \$419,272 respectively, both new one-time contributions for 2022.¹⁹⁶ These numbers highlight the earlier criticism of inconsistent and unpredictable funding of the CTCN from year to year. As of the end of March, the CTCN was able to point to over \$19 million in funding for 2023, however, only \$4,122,975 could be identified for 2024.¹⁹⁷ This is an example of the inconsistent and unpredictable funding that has plagued the CTCN.¹⁹⁸ Thus, establishing closer linkages between the Financial

¹⁸⁸ Majekolagbe, *supra* note 97, at 124.

¹⁸⁹ *Id.* at 123; Oh, *supra* note 113, at 538.

¹⁹⁰ *The Special Climate Change Fund (SCCF)*, UNITED NATIONS CLIMATE CHANGE, <https://unfccc.int/topics/climate-finance/resources/reports-of-the-special-climate-change-fund> [<https://perma.cc/8HEX-78TT>] (last visited Apr. 19, 2023).

¹⁹¹ *About GCF*, GREEN CLIMATE FUND, <https://www.greenclimate.fund/about> [<https://perma.cc/QJ46-X95Y>] (last visited May 20, 2023).

¹⁹² *UNEP and the Global Environment Facility*, UN ENVIRONMENT PROGRAMME, <https://www.unep.org/gef/> [<https://perma.cc/6Q69-42AF>] (last visited May 20).

¹⁹³ *About the Adaptation Fund*, ADAPTATION FUND, <https://www.adaptation-fund.org/about/> [<https://perma.cc/VX3K-LDY5>] (last visited May 20, 2023).

¹⁹⁴ U.N. Secretary General, *First periodic assessment of the effectiveness and adequacy of the support provided to the Technology Mechanism in supporting the implementation on matters relating to technology development and transfer*, *supra* note 148, at 9, 18 (“The CTCN has also built the capacity of project applicants for preparing GCF concept notes.”) (“The CTCN also continued to collaborate with the GEF; in 2022, the CTCN will start implementing the project Piloting Innovative Financing for Climate Adaptation Technologies in Medium-sized Cities as part of the GEF Challenge Program for Adaptation Innovation.”).

¹⁹⁵ *21st Advisory Board meeting, 27-29 March 2023: Financial Overview*, CLIMATE TECHNOLOGY CENTRE AND NETWORK, <https://www.ctc-n.org/sites/www.ctc-n.org/files/2023-04/18.%20CTCN%20Financial%20Matters.pdf> [<https://perma.cc/7FFM-6YX7>] (last visited April 21, 2023) at 6.

¹⁹⁶ *Id.* at 3.

¹⁹⁷ *Id.*

¹⁹⁸ *See id.*

Mechanism and the Technology Mechanism, which has long been advocated for by developing countries, could serve to mitigate the inconsistency.¹⁹⁹

Other recommendations include creating economic incentives for the private sector to engage with more developing countries' proposals²⁰⁰ and generally involving the private sector in more of the Technology Mechanism's processes.²⁰¹ These also stem from concerns of lower engagement with LDCs from the private sector.²⁰² Notably, both concerns of a lack of funding and engagement with developing countries from the private sector were voiced following the Paris Agreement's Technology Framework.²⁰³

While much of the focus has been on the CTCN due to its more hands-on role, the TEC has not been immune from criticisms.²⁰⁴ Criticisms have included TEC's failure to track its initiatives and projects, as well as TEC's failure to collect and present data that can better show the work that it has done.²⁰⁵ Overall, all of the criticisms have stressed a common theme: a desire for more from the Technology Mechanism and its two bodies.

Part IV: Technology Mechanism at COP 27: A New Joint Work Programme

Heading into COP 27 in Sharm El-Sheikh, Egypt, once again, much of the discussion was on issues other than the Technology Mechanism, as creating a fund for loss and damage and allocating money for adaptation projects were top priorities.²⁰⁶ However, three items pertaining to the Technology Mechanism were on the agenda under "Development and transfer of technologies and implementation of the Technology Mechanism."²⁰⁷ The three items were the joint report of the TEC and the CTCN, "linkages between the Technology Mechanism and the Financial Mechanism of the Convention," and the first periodic assessment of the Technology Mechanism as required under the Paris Agreement.²⁰⁸

The Joint Annual Report of the TEC and the CTCN for 2022 was relatively straightforward. The parties were not determining the language of the report itself, but rather providing feedback on the report.²⁰⁹ Specifically, the report detailed the development of a new joint work programme

¹⁹⁹ Majekolagbe, *supra* note 97, at 126.

²⁰⁰ Oh, *supra* note 113, at 536–37.

²⁰¹ Woo Jin Lee, Irma Juskenaitė & Rose Mwebaza, *Public–Private Partnerships for Climate Technology Transfer and Innovation: Lessons from the Climate Technology Centre and Network*. 13(6) *SUSTAINABILITY* at 11 (2021), <https://doi.org/10.3390/su13063185> [<https://perma.cc/EGY4-PAT8>].

²⁰² Majekolagbe, *supra* note 97, at 123.

²⁰³ *Taking Stock of the Paris Agreement on Climate Change*, INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT (Jan. 28, 2016), <https://sdg.iisd.org/commentary/policy-briefs/taking-stock-of-the-paris-agreement-on-climate-change/> [<https://perma.cc/Z72M-ZR8T>].

²⁰⁴ Majekolagbe, *supra* note 97, at 121–22.

²⁰⁵ *Id.* at 122.

²⁰⁶ Kenneth John Markowitz & Kerry Mackenzie, *United States: Key Issues At COP 27*, MONDAQ (Oct. 24, 2022), <https://www.mondaq.com/unitedstates/climate-change/1242948/key-issues-at-cop-27> [<https://perma.cc/QC72-5MHT>].

²⁰⁷ U.N. Executive Secretary, Subsidiary Body for Implementation: Provisional agenda and annotations, U.N. Doc. FCCC/SBI/2022/12 (Aug. 26, 2022); U.N. Executive Secretary, Subsidiary Body for Scientific and Technological Advice: Provisional agenda and annotations, U.N. Doc. FCCC/SBSTA/2022/7Rev.1 (Sept. 30, 2022).

²⁰⁸ U.N. Executive Secretary, Subsidiary Body for Implementation: Provisional agenda and annotations, U.N. Doc. FCCC/SBI/2022/12 (Aug. 26, 2022).

²⁰⁹ U.N. Chairs of Framework Convention on Climate Change, *Joint annual report of the Technology Executive Committee and the Climate Technology Centre and Network: Draft conclusions proposed by the Chairs*, U.N. Doc. FCCC/SB/2022/L.16, at 1 (Nov. 12, 2022).

between the CTCN and TEC that “addresses themes of common interest [between the two bodies] and will help to further enhance coherence, synergies and collaboration between the bodies while allowing them flexibility to perform their respective functions”²¹⁰ In the same paragraph the report states that the joint work programme will cover the five key themes of the Technology Framework as laid out in the Paris Agreement.²¹¹ The development of this new joint work programme stemmed from calls at COP 26 for the two Technology Mechanism to “strengthen their collaboration.”²¹²

Technology Mechanism members finalized this new Joint Work Programme less than two months before COP 27.²¹³ The Joint Work Programme includes individual work plans for both the TEC and the CTCN as well as a joint work plan for a host of collaborative efforts.²¹⁴ This Joint Work Programme, the first of its kind, looks to coordinate long-term strategies of the TEC and the CTCN to “elevate the performance of the Technology Mechanism and increase its impact.”²¹⁵ The Joint Work Programme establishes six “common areas of work” with each of the six areas referencing the CTCN’s technical assistance work and ways the TEC can support and enhance this work.²¹⁶ Additionally, the Joint Work Programme also mentioned agreements from COP 26 citing “the importance of predictable, sustainable and adequate funding for the Technology Mechanism.”²¹⁷

In the negotiations on the joint report, the parties “welcome[d] with appreciation” the new joint work programme, indicating that all parties viewed it positively.²¹⁸ The recommendations specifically reference support for the aforementioned six key joint activities, which include: “technology road maps, digitalization, national systems of innovation, water—energy—food systems, energy systems, buildings and infrastructure, business and industry, and technology needs assessment.”²¹⁹ Overall, the reaction to the new Joint Work Programme was overwhelmingly positive and on November 15, 2022, leaders from several countries and the UNFCCC announced the launching of the joint work programme with \$3 million from the United States to implement it.²²⁰ In addition to the United States’ contribution to the new joint work programme, several other

²¹⁰ *U.N. Framework Convention on Climate Change, Joint annual report of the Technology Executive Committee and the Climate Technology Centre and Network for 2022*, U.N. Doc. FCCC/SB/2022/4, at 4 (Sept. 28, 2022).

²¹¹ *Id.*

²¹² *Id.* at 3.

²¹³ *U.N. Framework Convention on Climate Change, Joint Work Programme of the UNFCCC Technology Mechanism for 2023-2027*, UNFCCC (Oct. 24, 2022),

https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_key_doc/525876375aa8467eb6379f868b925e49/51b7785f86b54889837fecbcb7aeb6b.pdf [<https://perma.cc/KGV4-P9G5>].

²¹⁴ *Id.*

²¹⁵ *Id.*

²¹⁶ *Id.*

²¹⁷ *Id.*

²¹⁸ *U.N. Chairs of Framework Convention on Climate Change, Joint annual report of the Technology Executive Committee and the Climate Technology Centre and Network: Draft conclusions proposed by the Chairs*, U.N. Doc. FCCC/SB/2022/L.16, at 2 (Nov. 12, 2022).

²¹⁹ *Id.*

²²⁰ *See id.*; *Joint Work Programme of the UNFCCC Technology Mechanism Launched at COP27*, UN ENVIRONMENT PROGRAM, UN CLIMATE TECHNOLOGY CENTRE AND NETWORK, AND UN CLIMATE CHANGE (Nov. 15, 2022). <https://unfccc.int/news/joint-work-programme-of-the-unfccc-technology-mechanism-launched-at-cop27> [<https://perma.cc/LXF7-9FKL>].

parties announced funding commitments, including €3 million from European Union to the CTCN, €1.5 million from Germany to the CTCN and €500,000 to the TEC, and \$6 million from Canada to the CTCN.²²¹ Additionally, Japan committed to continue its regular contributions to the CTCN.²²²

Not all of the agenda items saw the positive outcome that the joint report of the TEC and CTCN received. The agenda item on linkages between the Financial Mechanism and the Technology Mechanism included a note highlighting collaborative activities undertaken by the two Technology Mechanism bodies and the operating entities of the financial mechanism.²²³ The short report detailed several instances of collaboration, mostly involving collaboration in preparing presentations, educational and information-sharing events, and policy papers.²²⁴ The report notes two instances of collaboration between the CTCN and Financial Mechanism that resulted in funding for developing country projects. The first, a pilot program for implementing “innovative financing for climate adaptation technologies in medium-sized cities,” received \$677,000 after being one of ten projects selected out of over 400.²²⁵ This program will aide planners in three cities in Antigua and Barbuda, Lao, and Mozambique to adopt “a systematic approach to prioritizing infrastructure needs, identifying key investment projects for matching with private financiers, and obtaining climate change technology information and data from CTCN Network partners.”²²⁶ The second instance has involved the CTCN providing assistance to countries submitting GCF readiness support proposals focused on priority technologies, with 31 of the proposals being approved for a total of \$10.4 million over a period of approximately four years.²²⁷

Despite the note’s highlights of collaborations, developing countries were not satisfied. Debate over the language of the negotiating text highlighted criticisms of the CTCN discussed above. These included developing countries stressing the importance of stable funding for the CTCN,²²⁸ the need for more accessible financing of projects,²²⁹ and reference to Paris Agreement language calling for financial support from the Financial Mechanism on projects that the Technology Mechanism supports.²³⁰ Ultimately, struggles to even produce draft negotiating text on linkages between the two mechanisms led the issue to be deferred to subsidiary body meetings in Bonn, Germany, where parties were able to agree on outcomes.²³¹ These outcomes included a workshop to be held at the subsidiary body meetings in Summer 2024 and a synthesis report to be completed in 2024.²³² The issue of linkages between the Technology Mechanism and the Financial Mechanism is slated to be on the agenda of COP 29 in November 2024, following the completion

²²¹ *Joint Work Programme of the UNFCCC*, *supra* note 220.

²²² *Id.*

²²³ U.N. General Secretary, *Activities undertaken by the Technology Executive Committee, the Climate Technology Centre and Network and the operating entities of the Financial Mechanism to strengthen linkages between the Technology Mechanism and the Financial Mechanism*, U.N. Doc. FCCC/SBI/2022/INF.6, at 1 (May 20, 2022).

²²⁴ *Id.* at 9–10.

²²⁵ *Id.* at 10.

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ Delegate of Chile, Negotiation on SBI 17(b) at UNFCCC COP 27.

²²⁹ Delegate of Philippines, Negotiation on SBI 17(b) at UNFCCC COP 27.

²³⁰ Delegate of China, Negotiation on SBI 17(b) at UNFCCC COP 27; *See* Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104, at Article 10.5.

²³¹ Development and transfer of technologies and implementation of the Technology Mechanism: linkages between the Technology Mechanism and the Financial Mechanism of the Convention, U.N. Doc. FCCC/SBI/2023/L.4 at 2 (Jun. 11, 2023).

²³² *Id.*

of the aforementioned outcomes.²³³ Thus, although not as fast as some would like, progress on linking the Financial Mechanism and the Technology Mechanism is being made.

The final agenda item at COP 27 pertaining to the Technology Mechanism involved a review of a periodic assessment of the Technology Mechanism by the UNFCCC, as required by the COP 21 decision in Paris that also established the Technology Framework.²³⁴ The periodic assessment, the first one conducted, reviewed the work of the Technology Mechanism over the five-year period spanning 2017–2021, providing eight recommendations to the CTCN and TEC following a detailed analysis of its work.²³⁵

The report acknowledged several areas where the Technology Mechanism has seen success.²³⁶ Specifically, the report cited successful technical assistance projects from the CTCN, positive perception among stakeholders, and the meeting of goals surrounding delivery of activities among a list of successes.²³⁷ Additionally, the report specifically mentioned cooperation with the operating entities of the Financial Mechanism as beneficial to the CTCN, specifically citing collaboration with the GCF on readiness projects, collaboration with the GEF on its Challenge Program for Adaptation Innovation, and an increase in dialogue surrounding efforts to increase collaboration.²³⁸

The seventh recommendation in the report encouraged the CTCN and TEC to seek to improve resource mobilization, citing “[f]inancial autonomy [as] a persistent challenge for the CTCN.”²³⁹ Further, this recommendation encourages the CTCN to diversify its sources and specifically strengthen collaboration with the Financial Mechanism’s operating entities to “facilitate[e] access to funding for CTCN activities.”²⁴⁰

Throughout the report, there are numerous mentions of the CTCN’s funding struggle.²⁴¹ The assessment notes that the CTCN’s “irregular, unpredictable and complicated to manage” funding resulted in the CTCN failing to deliver on its annual operating budget for 2017–2019, although it was able to do so in both 2020 and 2021.²⁴² Further, the assessment notes that over the five-year period, while the CTCN had average annual funding of \$8.89 million, the funding fluctuated up to \$9.5 million year-to-year, with the funding level going from \$3.82 million in 2019 to \$13.37 million in 2020.²⁴³ The assessment also noted the struggles of the CTCN to secure either multi-year contributions or annual contributions.²⁴⁴ Thus, while the Technology Mechanism was

²³³ *Id.* at 2–3.

²³⁴ *First periodic assessment of the effectiveness and adequacy of the support provided to the Technology Mechanism in supporting the implementation on matters relating to technology development and transfer*, U.N. Doc. FCCC/SBI/2022/13, at 1 (Sep. 5, 2022).

²³⁵ *Id.* at 4.

²³⁶ *See id.* at 20–22.

²³⁷ *Id.* at 20–21.

²³⁸ *Id.* at 18.

²³⁹ *Id.* at 24.

²⁴⁰ *First periodic assessment of the effectiveness and adequacy of the support provided to the Technology Mechanism in supporting the implementation on matters relating to technology development and transfer*, U.N. Doc. FCCC/SBI/2022/13, at 24 (Sep. 5, 2022).

²⁴¹ *Id.* at 17–19, 24.

²⁴² *Id.* at 19.

²⁴³ *Id.* at 17.

²⁴⁴ *Id.* at 18.

able to perform a great deal of work positively helping developing countries access financing and implement climate technology, the funding issue remains a barrier to the CTCN and the Technology Mechanism as a whole reaching its potential.

Other recommendations of the assessment include prolonged engagement in technical assistance projects to better assess and improve long-term outcomes, increase its focus of adaptation technical assistance projects, which are far fewer than mitigation technical assistance projects, and increasing collaboration between the two bodies.²⁴⁵ The parties' conclusions on the assessment largely echoed what was said in the assessment noting "with concern" the continued challenge of securing funding and encouraging "those in the position to do so" to provide necessary support. Additionally, the parties encouraged the CTCN to continue to improve engagement with parties to find funding following the conclusion of its technical assistance and welcomed the Joint Work Programme.²⁴⁶

During the year following COP 27, the Technology Mechanism's two operating bodies each met twice. At these meetings, areas of success were presented. Several developing countries, including Mongolia, St. Kitts and Nevis, and South Africa presented on the positive impacts of the CTCN's technical assistance.²⁴⁷ Presentations were also made by staff from the Adaptation Fund, GCF, and GEF on increased collaborations between each entity and the Technology Mechanism.²⁴⁸

Several major shortfalls were also expressed, including African representatives sharing frustrations of African NDEs, who question why the CTCN is not doing more and whether it is even needed.²⁴⁹ The CTCN also sounded the alarm on a familiar issue: impending funding gaps.²⁵⁰ At the 22nd meeting of the CTCN's Advisory Board, the CTCN reported that it was facing a funding gap of approximately \$22 million for its period of work for 2023–2027.²⁵¹ As of September 2023, the CTCN had a total of \$7.7 million for 2025–2027.²⁵² Thus, while the Joint Work Programme was rightfully met with great enthusiasm, and other areas of progress were celebrated, other aspects of the Technology Mechanism, including the issue of uncertain funding,

²⁴⁵ *First periodic assessment referred to in paragraph 69 of decision 1/CP.21*, U.N. Doc. FCCC/SBI/2022/L.27/Add.1, at 2 (Nov. 12, 2022).

²⁴⁶ *Id.*

²⁴⁷ *22nd CTCN Advisory Board Meeting*, CLIMATE TECHNOLOGY CENTRE AND NETWORK, <https://www.ctc-n.org/calendar/events/22nd-ctcn-advisory-board-meeting> [<https://perma.cc/6QXW-8LLS>] (See agenda item 20 on Day 3).

²⁴⁸ See Kazem Kashefi, *Intervention by the Adaptation Committee*, ADAPTATION COMMITTEE (Sept. 25, 2023), https://www.ctc-n.org/sites/www.ctc-n.org/files/2023-10/17.2%202023_CTCN22AdvisoryBoardMtg_Kazem.pdf [<https://perma.cc/FPV6-T857>]; See also Patricia Marcos Huidobro, *GEF Support to Climate Technology Development and Transfer*, GLOBAL ENVIRONMENT FACILITY (Sept. 22, 2023), https://www.ctc-n.org/sites/www.ctc-n.org/files/2023-10/17.4A_%20GEF_CTCN22.pdf [<https://perma.cc/5L96-LL28>]; See also Hansol Park, *Green Climate Fund*, Green Climate Fund, https://www.ctc-n.org/sites/www.ctc-n.org/files/2023-10/17.4B_GCF_Hansol%20Park_CTCN22_2023.pdf [<https://perma.cc/A3YY-26WZ>].

²⁴⁹ UN Climate Change – Events, *22nd meeting of the Advisory Board of the Climate Technology Center and Network*, at 1:24:40, YOUTUBE (Sept. 27, 2023), https://www.youtube.com/watch?v=nmY23jT73E4&ab_channel=UNClimateChange-Events [<https://perma.cc/RJ32-869W>] (Representative of Nigeria discussing recent conversations with African NDEs that indicate they are losing faith in the ability of the CTCN to have real, substantial impacts).

²⁵⁰ See *Draft CTCN Chapter of the 2023 Joint Annual Report*, U.N. Doc. AB/2023/22/18 at p. 15 (Sept. 2023).

²⁵¹ *Id.* ("A funding gap of approximately USD 22 million . . . is a concern and a challenge to maintain continuity of the CTCN's operations.")



²⁵² *Id.*

are in drastic need of improvement. Without the necessary consistent funding, successes and improvements risk being lost and shortfalls risk being unaddressed.

Part V: Consistent Funding for the CTCN and Technology Mechanism is Needed

To achieve the potential that many envision the TEC and CTCN having upon its creation, consistent and stable avenues for funding the CTCN are needed. While the Joint Work Programme is sure to have improvements on the operations of the Technology Mechanism, to ensure the CTCN's long-term success, more consistent and predictable funding is needed. The first assessment of the Technology Mechanism since the Paris Agreement makes this clear, multiple times.²⁵³

The presence of money dedicated for 2026-2027 in the CTCNs available funds shows that this multi-year budget planning is possible.²⁵⁴ The snapshot of “[f]unds available as at end 2022” that the CTCN presented at its most recent Advisory Board meeting in March 2023 also shows that these funds, while present, are lacking.²⁵⁵

Funds available as at end 2022		 				
Donor	Conditionalities as per Donor Agreements	2023	2024	2025	2026	2027
Validity of Funds						
Multi Donor Trust Fund ^A	Unearmarked	\$8,803,908	\$1,092,000	\$1,092,000	\$1,092,000	
European Commission (NDICI)	Approved Budget	\$2,556,870	\$545,430			
Denmark	Approved Budget	\$414,940				
Japan (MOE)	Mitigation Developing Countries	\$1,282,861				
Japan (MOE)	Mitigation Developing Countries	\$350,014				
Japan (MOE)	Mitigation Developing Countries	\$459,047				
The Republic of Korea	CTCN Liaison Office	\$3,286,946	\$2,000,000	\$2,000,000		
Adaptation Fund	Approved Budget	\$2,016,471	\$485,545	until May		
TOTAL		19,171,058	4,122,975	3,092,000	1,092,000	-

^A Multi Donor Trust Fund includes contributions received from Canada (2013 & 2023), Germany, Finland, Ireland, Italy, Norway, Spain, UK, and USA.

Here, the issue of uncertainty is clearly shown. While the over \$19 million for 2023 is great in comparison to the history of the CTCN's yearly funding, the presence of only \$4 million dedicated next year is concerning. Ultimately, the CTCN Advisory Board approved a budget of approximately \$10 million for 2023, leaving it with a total of \$17.7 million in funds for 2024–2027.²⁵⁶ With an approved budget of \$10 million for 2024, the CTCN is left with \$7.7 million for

²⁵³ U.N. Secretary General, *supra* note 194, at 17, 19, 24.

²⁵⁴ U.N. Environment Programme & U.N. Climate Technology Centre & Network, 21st Advisory Board meeting, 27-29 March 2023: Financial Overview, <https://www.ctc-n.org/sites/www.ctc-n.org/files/2023-04/18.%20CTCN%20Financial%20Matters.pdf> [<https://perma.cc/WU99-7CN7>] (last visited Apr. 21, 2023).

²⁵⁵ *Id.*

²⁵⁶ *Draft CTCN Chapter of the 2023 Joint Annual Report*, U.N. Doc. AB/2023/22/18 at p. 15 (Sept. 2023).

2025–2027, leading to the substantial \$22 million funding gap.²⁵⁷ While it is possible, even likely, that there will be a substantial increase in this number by the time that 2024 rolls around, the uncertainty as to what that number will be makes planning harder. This funding gap illustrates the points made in the first periodical assessment of the Technology Mechanism presented at COP 27 regarding CTCN's struggles to obtain multi-year contributions.²⁵⁸

Recurring payments make planning and budgeting for the future easier.²⁵⁹ Thus, by setting up a substantial amount of funding over several years, the CTCN and Technology Mechanism will be able to better plan its activities and projects. These efforts include being able to increase follow-up efforts with technical assistance projects, increase aid to developing countries seeking funding from Financial Mechanism entities, and increasing engagement with NDEs, all recommendations given in the first periodic assessment at COP 27.²⁶⁰

To do this, the Technology Mechanism should look to familiar partners to provide multi-year funding. Parties should come together to provide a linkage between the Financial Mechanism and Technology Mechanism that provides a consistent, multi-year stream of funding to the CTCN. Building linkages between the financial mechanisms of the UNFCCC and efforts to implement technology transfer were an original goal of the 1992 agreement establishing the UNFCCC.²⁶¹ At COP 27, this remained a goal, as seen by its appearance on the agenda²⁶² and several instances of collaboration, detailed in the periodic assessment presented at COP 27.²⁶³ While much of this focus has been on collaborative efforts in the operations of the two mechanisms,²⁶⁴ the Adaptation Fund, GEF, and GCF have all contributed significant amounts of money to the CTCN's operational budget.²⁶⁵ If these entities could dedicate coordinated funding over a multi-year period, perhaps for the five-year duration of the Joint Work Programme, this could ease the inconsistency and predictability issues the CTCN and Technology Mechanism have faced.

Additionally, the Technology Mechanism and the CTCN need to look to developed countries to step up and contribute multi-year donations. Developed countries have accounted for over 80 percent of the CTCN's funding.²⁶⁶ Thus, if the CTCN is to get the stable funding that many seek, it is likely that these countries will need to contribute. This is not unprecedented. Several countries have made multi-year contributions to the CTCN, with Canada announcing such a contribution at COP 27 and Japan continuing its yearly contribution.²⁶⁷ At COP 26, the CTCN convened a "high-level donor round table" that resulted in 2021 funding that was 26 percent higher

²⁵⁷ *Id.*

²⁵⁸ U.N. Secretary General, *supra* note 194.

²⁵⁹ *Pros and Cons of Recurring Payments*, RELIABILLS (May 1, 2022), <https://www.reliabills.com/blog/pros-and-cons-of-recurring-payments/> [<https://perma.cc/ZB93-JD8M>].

²⁶⁰ U.N. Secretary General, *supra* note 194, at 18, 23–24.

²⁶¹ Majekolagbe, *supra* note 97, at 126.

²⁶² U.N. Executive Secretary, Subsidiary Body for Implementation: Fifty-seventh session: Provisional agenda and annotations, U.N. Doc. FCCC/SBI/2022/12 (Aug. 26, 2022).

²⁶³ U.N. Secretary General, *supra* note 194.

²⁶⁴ *Id.* at 18.

²⁶⁵ *Donors of the CTCN*, CLIMATE TECHNOLOGY CENTRE AND NETWORK, <https://www.ctc-n.org/about-ctcn/donors#:~:text=The%20work%20of%20the%20CTCN%20is%20supported%20by%20voluntary%20contributions> [<https://perma.cc/XUU5-XY56>] (last visited March 12, 2023).

²⁶⁶ *Id.*

²⁶⁷ *Joint Work Programme of the UNFCCC Technology Mechanism Launched at COP27*, UN ENVIRONMENT PROGRAM, UN CLIMATE TECHNOLOGY CENTRE AND NETWORK, AND UN CLIMATE CHANGE (Nov. 15, 2022), <https://unfccc.int/news/joint-work-programme-of-the-unfccc-technology-mechanism-launched-at-cop27> [<https://perma.cc/2CSW-E7TA>].

than the previous year.²⁶⁸ Another gathering of high-level funders, including Financial Mechanism entities and developed countries, should be commenced, this time with a focus on providing the multi-year funding necessary to provide the predictability and stability that the CTCN and Technology Mechanism needs. This funding effort should also involve private sector funders, which have not played much of a role in funding the Technology Mechanism's work to date but is an area that the first periodic assessment encouraged the Technology Mechanism to explore.²⁶⁹

To answer the question of whether technical assistance is enough for the Technology Mechanism, the answer is yes. If there is a dedicated multi-year funding source for the Technology Mechanism, it will allow for better long-term planning that can focus on other goals, including helping developing countries secure funding from other UN bodies, such as Financial Mechanism entities, that have more money to directly fund larger scale projects.²⁷⁰ It will also allow for more follow-up with technical assistance efforts like Burundi's SLAMDAM pilot program which can lead to more long-term, scaled-up results.²⁷¹ Even projects not centered around pilot projects, such as the early Chilean project, can benefit through continued engagement to help see quicker results.

The Joint Work Programme is a great move in the right direction to improve the Technology Mechanism, but it alone is not enough. Increasing engagement between the CTCN and the TEC is sure to be beneficial, but the announcement of one-time funding from several developed countries continues the issue of financial unpredictability and instability that has plagued the CTCN. To avoid future instances of great funding fluctuation and uncertainty, like what occurred in 2019, consistent funding is needed.²⁷² Here, the Technology Mechanism can ramp up efforts to better both internal and external collaboration. With the ambitious goal and purpose of the Joint Work Programme being to deploy "technological solutions at a faster pace and at scale," the issue of funding becomes even more glaring.²⁷³ Further, much of the Joint Work Programme focuses on improving and enhancing the work of the Technology Mechanism rather than creating new programs within it.²⁷⁴ Thus, the issues relating to funding that have prevented more effective technology transfer and scaling of climate technologies will remain if nothing changes with the funding.²⁷⁵

Creating predictable multi-year funding is also comparatively straightforward. Other suggestions of completely restructuring the Technology Mechanism by bringing it under the

²⁶⁸ U.N. Secretary General, *supra* note 194, at 19.

²⁶⁹ *Id.* at 15, 18.

²⁷⁰ *Id.* at 7.

²⁷¹ Closure Report for Technical Assistance: Flood and drought damage prevention with SLAMDAM, CLIMATE TECHNOLOGY CENTRE AND NETWORK (2022), https://www.ctc-n.org/system/files/dossier/3b/B.%20TA_closure%20report_template_SLAMDAM%20%28FINAL%29.pdf [https://perma.cc/S6NZ-EZEG].

²⁷² U.N. Secretary General, First periodic assessment of the effectiveness and adequacy of the support provided to the Technology Mechanism in supporting the implementation on matters relating to technology development and transfer, U.N. Doc. FCCC/SBI/2022/13, at 17 (Sep. 5, 2022).

²⁷³ U.N. Framework Convention on Climate Change, Joint Work Programme of the UNFCCC Technology Mechanism, at 5 (Oct. 24, 2022), https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_key_doc/525876375aa8467eb6379f868b925e49/51b7785f86b54889837fecbcb7aebc6b.pdf [https://perma.cc/YR99-AHCB].

²⁷⁴ *Id.*

²⁷⁵ *See* Sullivan, *supra* note 27, at 17–18.

purview of the Financial Mechanism or combining it with existing entities already under the Financial Mechanism overcomplicate the problem.²⁷⁶ If predictable multi-year funding is provided to the Technology Mechanism, it has shown that it can effectively aid developing countries in implementing innovative climate technology solutions, as demonstrated by both the work it has done with limited and inconsistent funds and the periodic assessment accepted at COP 27.²⁷⁷ Thus, reinventing the wheel and overhauling the structure of the Technology Mechanism would only delay progress in an area where time is of the essence.²⁷⁸

While some have called for increasing the total yearly funding for the Technology Mechanism and CTCN, the focus should start with establishing a base amount of consistent, multi-year funding.²⁷⁹ The CTCN has proven that it can leverage private money to fund projects, with hundreds of millions of dollars leveraged in both 2020 and 2021.²⁸⁰ Thus, additional total funding to the CTCN would largely support scaling up of its work. While this is a goal of the new Joint Work Programme,²⁸¹ achieving this goal will remain difficult absent stable year-to-year funding.²⁸² Further, efforts to increase collaboration between the Financial Mechanism and the Technology Mechanism can alleviate the need for exponentially more funding, as much of this collaboration is geared towards the Technology Mechanism aiding developing countries access Financial Mechanism funding.²⁸³ Thus, the immediate focus should be on creating a consistent source of funding.

Is creating consistent and recurring funding alone enough? Of course not. It will take the effort of many to ensure that the Technology Mechanism has the positive impact that it needs to, as is the case with the larger challenge of tackling climate change. However, it is a necessary step if the Technology Mechanism is to scale up its work and produce better results. Thus, creating this source of funding should be prioritized by UNFCCC parties.

Conclusion

COP 27 put the potential of the Technology Mechanism on display. With the acceptance of the first periodic assessment of the Technology Mechanism since the Paris Agreement and the establishment of a new Joint Work Programme funded by developed countries, there is a lot of optimism. However, COP 27 also highlighted a continued issue of the Technology Mechanism with the failure to reach any agreement on linkages between it and the Financial Mechanism. While much of the discussion on this issue is around allowing the CTCN to better aid developing

²⁷⁶ See Majekolagbe, *supra* note 97, at 126–27.

²⁷⁷ U.N. Secretary General, *supra* note 194, at 20 (“signs have been observed of favourable conditions being created by the Technology Mechanism for the adoption of new and existing technologies by developing countries, including the implementation of recommendations on policy, strategy and action plan development from CTCN technical assistance projects”).

²⁷⁸ Hal Harvey et al., *The Costs of Delay*, ENERGY INNOVATION POLICY & TECHNOLOGY LLC, at 7 (Jan. 2021), https://energyinnovation.org/wp-content/uploads/2021/01/Cost_of_Delay.pdf [<https://perma.cc/7532-VY86>] (“Early action is crucial—and delays will lead to irreversible loss.”).

²⁷⁹ Sullivan, *supra* note 27, at 17–18.

²⁸⁰ U.N. Secretary General, *supra* note 194, at 11.

²⁸¹ U.N. Framework Convention on Climate Change Joint Work Programme of the UNFCCC Technology Mechanism, at 5 (Oct. 24, 2022), https://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/TEC_key_doc/525876375aa8467eb6379f868b925e49/51b7785f86b54889837fecbcb7aecb6b.pdf [<https://perma.cc/NGA5-RW8U>].

²⁸² See Sullivan, *supra* note 27, at 18.

²⁸³ U.N. Secretary General, *supra* note 194, at 18.

countries in taking advantage of Financial Mechanism money, the issue of inconsistent and unpredictable funding looms in the background.

To move the Technology Mechanism forward and towards the direction of realizing its full potential, consistent long-range funding is needed. The new Joint Work Programme is a step in that direction, but it still leaves the issue of consistent multi-year contributions untouched. The CTCN has demonstrated that it can effectively mobilize its Network and leverage funding to have a real, positive impact on a developing country's efforts to develop innovative climate technology through technical assistance. With enhanced collaboration between the TEC and the CTCN, as well as between the Technology Mechanism and the operating entities of the Financial Mechanism, the Technology Mechanism's work will only improve. However, if funding remains uncertain from year to year, the progress also remains uncertain. Thus, dedicated funding over several years is needed to provide for adequate planning and to add stability to the work of both the CTCN and the larger Technology Mechanism.