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Poznan strategic programme on technology transfer

Status and successes of, challenges in and lessons learned from projects undertaken through the regional climate technology transfer and finance centres

Note by the secretariat

Summary

This document contains up-to-date information on the status of the pilot regional climate technology transfer and finance centres under the Global Environment Facility, including successes, challenges, lessons learned and key findings in relation to their project activities.

Abbreviations and acronyms

ADB	Asian Development Bank
AfDB	African Development Bank
COP	Conference of the Parties
CTCN	Climate Technology Centre and Network
CTFC	climate technology transfer and finance centre
EBRD	European Bank for Reconstruction and Development
FAO	Food and Agriculture Organization of the United Nations
FINTECC	Finance and Technology Transfer Centre for Climate Change
GEF	Global Environment Facility
IADB	Inter-American Development Bank
IEA	International Energy Agency
NAP	national adaptation plan
NDC	nationally determined contribution
NDE	national designated entity
PSP	Poznan strategic programme on technology transfer
SBI	Subsidiary Body for Implementation
SCCF	Special Climate Change Fund
TEC	Technology Executive Committee
TNA	technology needs assessment
UNEP	United Nations Environment Programme
WRI	World Resources Institute

I. Executive summary

1. The GEF submitted for consideration at COP 16 a plan for the long-term implementation of the PSP,[1] including the following elements in relation to scaling up investment in environmentally sound technologies in developing countries:

(a) Supporting climate technology centres and a climate technology network;

(b) Piloting priority technology projects to foster innovation and investment;

(c) Public–private partnerships for technology transfer;

(d) Supporting TNAs;

(e) The GEF as a catalytic supporting institution for technology transfer.

2. Under the PSP, the GEF structured and implemented a technology transfer programme, which includes the element of supporting climate technology centres and a climate technology network. This resulted in projects for four pilot regional CTFCs (see the table below), of which those for Asia and the Pacific[2] and Latin America and the Caribbean[3] have been concluded, while the African CTFC and FINTECC will be operational until 2023.

Overview of pilot regional climate technology transfer and finance centres

GEF project title	*Region*	*Project implementing agency*	*GEF financing (USD million)*		*Co-financing* (USD million)*	*Status*
			GEF Trust Fund	*SCCF*		
Pilot African Climate Technology Finance Center and Network	Africa	AfDB	10.0	5.8	89.0	CTFC operational until June 2023
Finance and Technology Transfer Centre for Climate Change	Europe and Central Asia	EBRD	10.0	2.0	77.0	CTFC operational until December 2023
Pilot Asia-Pacific Climate Technology Network and Finance Center	Asia and the Pacific	ADB/ UNEP	10.0	2.0	74.7	Project concluded
Climate Technology Transfer Mechanisms and Networks in Latin America and the Caribbean	Latin America and the Caribbean	IADB	10.0	2.0	63.4	Project concluded

Source: FCCC/CP/2022/5.
Note: Co-financing figures are based on ex-ante estimates from the design stage of the CTFCs; where available, an update on the realized co-financing is provided in the respective section on the CTFC in this document.

3. This document elaborates on successes, challenges and lessons learned in relation to the CTFCs under the GEF[4] and their project activities focused on:

(a) Knowledge-building and networking to enhance capacity for climate technology development and transfer;

[1] See document FCCC/SBI/2010/25.
[2] See the terminal evaluation report, available at https://wedocs.unep.org/handle/20.500.11822/32547.
[3] See the terminal evaluation report, available at https://www.thegef.org/projects-operations/projects/4880.
[4] As mandated in document FCCC/SBI/2022/10, para. 103.

(b) Mainstreaming climate change mitigation and adaptation and integrating actions into national sustainable development strategies, programmes and policies;

(c) Piloting and leveraging private and public investment in climate technology in the regions.

4. All four CTFCs have undertaken activities for knowledge-building and networking, thereby strengthening countries' capacity to identify potential technology options for mitigation and adaptation, create an enabling policy and business environment for the technologies and link climate technology decision-making with sustainable development policymaking. The CTFCs have made extensive use of existing regional networks for climate and development, including those of multilateral development banks, for such activities.

5. For example, the African CTFC has supported nine research projects for implementing climate technology in sub-Saharan Africa; the CTFC for Latin America and the Caribbean trained government representatives in climate action planning and policymaking and engaged private sector entities in implementing pilot projects; the Asia-Pacific CTFC leveraged the operational networks in the region, such as the South-East and Central Asia Climate Change Networks, for its activities; and FINTECC has focused on developing the role of small and medium-sized enterprises in implementing climate technology.

6. By enhancing developing countries' awareness and knowledge of climate technology, including costs and requirements for implementation, the CTFCs have strengthened the countries' capacity and access to key resources, particularly finance, for implementing climate technology.

7. The CTFCs have also strengthened developing countries' capacity to mainstream climate technology in their sustainable development strategies and policies, which has supported establishment of interlinkages of CTFC work with other UNFCCC processes, such as for TNAs, NAPs and NDCs. Furthermore, the CTFCs have stimulated multilateral development organizations to go beyond their 'business as usual' activities and mainstream climate technology transfer in the regions.

8. Through interlinkages with relevant regional networks and by providing co-financing, the CTFCs have contributed to leveraging investment in climate projects, which has generally reduced project investment risk. Investment support has been provided through the CTFCs in various forms, such as in-kind support (staff, government facilities, etc.) and funding, by, for example, the government of the country receiving the investment, agencies linked to the CTFCs and the private sector (e.g. investors in wind farms).

9. While initially mitigation projects were the focus of the CTFCs for financing, more recently there has been a significant shift in the allocation of resources towards adaptation, reflecting the responsiveness of the CTFCs to the growing interest in adaptation in international climate policy processes.

10. Considering the current priorities of the GEF for climate technology development and transfer, and the funding opportunities provided through its eighth replenishment, countries may wish to consider applying for GEF support for promoting innovation and enabling policies for development and transfer of technologies for mitigation and adaptation with systemic impacts, thus enabling the countries to build on the work carried out by the CTFCs.

II. Introduction

A. Background

11. In response to the request from COP 14 to consider the long-term implementation of the PSP,[5] the GEF submitted for consideration at COP 16 a plan comprising the following elements:[6]

(a) Supporting climate technology centres and a climate technology network;

(b) Piloting priority technology projects to foster innovation and investment;

(c) Public–private partnerships for technology transfer;

(d) Supporting TNAs;

(e) The GEF as a catalytic supporting institution for technology transfer.

12. In its annual reports to the COP,[7] the GEF reports on progress in carrying out activities under the PSP, including on experience and lessons learned, successes and challenges, and the long-term implementation of the PSP, for consideration by the SBI at its sessions.[8]

13. In 2015, the TEC prepared an evaluation of the PSP focusing, among other things, on lessons learned in implementing the PSP, as relevant to the operationalization of the Technology Mechanism, for consideration at SBI 43.[9]

14. In 2019, the TEC updated the evaluation of the PSP focusing, among other things, on the regional CTFCs (under the element referred to in para. 11(a) above of the plan the GEF submitted to COP 16). The TEC report on the updated evaluation of the PSP was considered at SBI 50.[10]

B. Mandate

15. SBI 56 requested the secretariat to prepare an information note with updated information on the status and successes of, challenges in and lessons learned from projects undertaken through the regional CTFCs for consideration at SBI 57.[11]

C. Objective

16. The objective of this document is to provide up-to-date information on the status and successes of, challenges in and lessons learned from projects undertaken through the regional CTFCs under the PSP.

17. The findings of the document aim to inform Parties on project activities undertaken by the CTFCs in the following areas: (1) knowledge-building and networking for capacity-building in relation to climate change mitigation and adaptation technology options; (2) mainstreaming and integrating climate change mitigation and adaptation in national sustainable development strategies, programmes, and policies; and (3) piloting and leveraging private and public climate technology investments in the regions.

[5] Decision 2/CP.14, para. 2(c–d).
[6] See document FCCC/SBI/2010/25.
[7] The report of the GEF to COP 27 is contained in document FCCC/CP/2022/5.
[8] As per document FCCC/SBI/2011/7, para. 137.
[9] FCCC/SBI/2015/16.
[10] FCCC/SBI/2019/7.
[11] FCCC/SBI/2022/10, para. 103.

D. Scope

18. For this document, the project activities of the CTFCs have been categorized according to their focus on:

(a) Knowledge-building and networking to enhance capacity for climate technology development and transfer;

(b) Mainstreaming climate change mitigation and adaptation and integrating actions into national sustainable development strategies, programmes and policies;

(c) Piloting and leveraging private and public investment in climate technology in the regions.

19. This document provides up-to-date information on the work of the CTFCs under these categories and key findings from their project activities. The information is derived from the terminal evaluation and midterm review reports for the GEF CTFC projects, the GEF report to COP 27 and interviews of CTFC staff and other relevant stakeholders.

III. Regional climate technology transfer and finance centres[12]

20. This chapter summarizes the activities of the pilot regional CTFCs, an overview of which is provided in the table above and describes how they have contributed to scaling up the level of investment in climate technologies in accordance with the overall objective of the PSP.[13]

A. African climate technology transfer and finance centre[14]

21. The African CTFC project is implemented by AfDB at its headquarters in Abidjan, Côte d'Ivoire, and aims to support sub-Saharan African countries[15] in scaling up the deployment of low-carbon and climate-resilient technologies. For adaptation-related technologies the CTFC focuses on the water sector and for mitigation-related technologies on the energy sector. To support activities in both sectors, the African CTFC established collaboration with the AfDB Water and Sanitation Department (adaptation technologies) and the AfDB Sustainable Energy for All[16] and related Sustainable Energy Fund for Africa initiatives[17] (mitigation technologies).

22. The CTFC was initially planned to be operational until 2017, but the project was extended until June 2023. The CTFC has a total budget of USD 14.34 million, of which USD 9.09 million from the GEF Trust Fund (for mitigation support in the energy sector) and USD 5.25 million provided through the SCCF (for adaptation-related action), plus

[12] While they use different abbreviations for their names, in this document each regional centre is referred to as a CTFC in combination with its region, except for FINTECC as it covers multiple regions and continents.

[13] As per decision 4/CP.13, para. 3.

[14] For information on the CTFC and its project activities, see https://www.thegef.org/projects-operations/projects/4904 and the project midterm review report, available at https://www.african-ctc.net/fileadmin/uploads/actc/Documents/Final__ACTFCN_Mid-term_Review_Report_20161011.pdf.

[15] Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Réunion, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Togo, Uganda, United Republic of Tanzania, Zambia and Zimbabwe. It also aims to support Western Sahara.

[16] See https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/sustainable-energy-for-all-se4all.

[17] See https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/sustainable-energy-fund-for-africa.

co-financing from AfDB instruments and sources outside the AfDB totalling USD 89 million.[18]

23. An important focus of the CTFC has been on improving market, institutional and policy conditions for deploying and diffusing climate technologies in sub-Saharan countries. Such 'first mile' support is intended to pave the way for accelerated and scaled-up investment in technology.

24. Moreover, the CTFC has supported feasibility studies and pilot projects for implementing technologies for mitigation and adaptation in the countries, such as providing financial support for demonstration projects.

25. According to the GEF, the support provided by the CTFC for feasibility studies and pilot projects has resulted in a total of USD 35.17 million being raised (part of the USD 89 million of co-financing mentioned above), which as at mid-2022 had been allocated to adaptation-related activities in the countries (such as pilot projects and feasibility studies).

B. Finance and Technology Transfer Centre for Climate Change[19]

26. The objective of FINTECC is to accelerate climate technology transfer in Kazakhstan, Ukraine, EBRD 'early transition' countries[20] and countries in the southern and eastern Mediterranean.[21] FINTECC has been integrated into the operational structure of EBRD, which has its headquarters in London and offices in FINTECC countries. It was initially planning to be operational in 2013–2016 but the project was extended until December 2023.

27. FINTECC assists governments in improving the legislative framework, implementation practices and provision of grants to encourage investment in climate technology. Furthermore, it assesses the applicability of climate technologies to the target countries and supports technology dissemination and awareness-raising activities to enable implementation of climate technology projects in the future, beyond FINTECC. It has collaborated with FAO and IEA to enhance its own capacity to engage in major policy dialogues across FINTECC countries.

28. Concerning overall budget, FINTECC has received USD 12 million (10 million and 2 million respectively) from the GEF and the SCCF. According to FINTECC, the originally targeted co-funding at the project design stage (USD 77 million) has been met and will be exceeded by the conclusion of the project.[22] According to the GEF, as at 30 June 2022, about 79 per cent of investment grants had been committed and disbursed across 30 projects.

29. FINTECC has allocated about 20 per cent of the GEF and SCCF funding to adaptation-related support. Initially, the focus was largely on mitigation technologies, but over time it has increasingly worked on technology solutions for adaptation, including assessing technology needs for adaptation in EBRD countries in areas such as agribusiness, built environment and municipal water management (see para. 67 below).

30. Concerning mitigation, FINTECC has supported several energy efficiency and renewable energy generation projects with capital grants. For example, as at 4 October 2022, FINTECC contributed USD 7 million in grants, leveraged with USD 126 million of EBRD green finance in Ukraine. A concrete example of capital grants is the provision of a USD 440,000 incentive grant to a EUR 1.4 million EBRD financing package for increasing

[18] The GEF requires certification of co-financing by means of letters from the agencies providing it. Throughout the project, that is implementation, midterm review and terminal evaluation, the GEF requests confirmation of the co-financing realized, which can be provided by the GEF funding-recipient country's government, CTFC agencies and/or the private sector or civil society.

[19] For information on FINTECC and its project activities, see https://www.thegef.org/projects-operations/projects/4956 and the project midterm review report, available upon request to the GEF.

[20] Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Mongolia, Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan.

[21] Egypt, Jordan, Lebanon, Morocco and Tunisia.

[22] The co-financing of FINTECC activities generally consists of two obligatory components and a third optional component: co-funding provided by EBRD and the investing company, plus optional co-funding provided by other development banks or local banks.

the energy efficiency of a company in Ukraine (e.g. by installing an energy management system and heat recovery system). Furthermore, two climate technology opportunity assessments were developed by FINTECC to assist project developers in assessing climate change mitigation and adaptation priorities in their region and sector.[23]

C. Asia-Pacific climate technology transfer and finance centre[24]

31. The work of the Asia-Pacific CTFC in support of technology development and transfer in South-East and Central Asia[25] was implemented through collaboration between UNEP and ADB: UNEP provided technology assistance, capacity-building and policy advice via its technology network secretariat in Bangkok, while ADB facilitated financial investments at its climate technology finance centre in Manila. The CTFC started operation in 2012 and the project was concluded in 2019, after an extension beyond the initially planned termination in 2015.

32. The CTFC received USD 10 million from the GEF and USD 2 million from the SCCF, with an expected project co-financing of USD 74.3 million. This budget was allocated mainly to supporting technology demonstration projects for mitigation (renewable energy and energy efficiency), such as implementing low-carbon district heating systems in Mongolia and integrated solar photovoltaics and energy storage in the Philippines.

33. The CTFC undertook adaptation-related activities with a focus on promoting technologies, such as for flood protection and disease prevention, as well as activities in the areas of land use, agriculture and water use (e.g. implementing new crop varieties, drip irrigation, new types of fertilizer and no- or low-till technologies). For example, Bhutan was assisted in identifying suitable climate adaptation technologies and financing options for its national irrigation master plan. Moreover, the CTFC completed a pre-feasibility study on options for scaling up rural renewable energy in Bangladesh.[26]

34. According to the terminal evaluation of the project, the CTFC successfully contributed to establishing and strengthening national and regional initiatives, policy advice, technology demonstrations and catalytic financing. Particularly, it supported the establishment of the CTCN in the region, which could build on the efforts of the CTFC to foster networking between national climate change focal points and NDEs.

D. Climate technology transfer and finance centre for Latin America and the Caribbean[27]

35. The project for the CTFC in Latin America and the Caribbean[28] was implemented by IADB at its headquarters in Washington, D.C., and five regional executing agencies with different focuses located across Latin America and the United States of America:

[23] It is estimated that the mitigation projects supported by FINTECC will reduce emissions by 0.3 million tonnes of carbon dioxide equivalent over a period of 10 years, which is 45 per cent of Ukraine's overall mitigation objective of 0.89 million tonnes of carbon dioxide equivalent.

[24] For information on the CTFC and its project activities, see https://www.thegef.org/projects-operations/projects/4512 and the terminal evaluation report, available at https://wedocs.unep.org/handle/20.500.11822/32547.

[25] Covering Bhutan, Cambodia, Indonesia, Kazakhstan, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Tajikistan, Thailand, Uzbekistan and Viet Nam.

[26] See https://www.adb.org/projects/documents/reg-45134-001-tcr.

[27] For information on the CTFC and its project activities, see https://www.thegef.org/projects-operations/projects/4880, including the terminal evaluation report.

[28] Covering Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Maarten (Dutch part), Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos, Uruguay, Venezuela (Bolivarian Republic of) and United States Virgin Islands.

(a) Bariloche Foundation in San Carlos de Bariloche, Argentina (focus: energy technology options);

(b) Tropical Agricultural Research and Higher Education Center in Turrialba, Costa Rica (focus: forestry technology options);

(c) Mexican National Institute of Ecology and Climate Change in Mexico City (focus: developing national policies and institutional capacity);

(d) FONTAGRO,[29] the regional fund for agricultural technology, in Washington, D.C. (focus: resilient agriculture);

(e) WRI in Washington, D.C. (focus: transportation technology options).

36. The CTFC was initially scheduled for operation in 2014–2017, but the project was extended until October 2020.

37. The benefit of multiple executing agencies with specific responsibilities was that the CTFC could tap into the sectoral knowledge base and networks of each agency for more effective and efficient operations.

38. The CTFC used its budget, comprising USD 10 million from the GEF and USD 2 million from the SCCF, augmented by co-financing of USD 227 million, for mitigation and adaptation projects in the priority areas of renewable energy, energy efficiency, transportation, forest monitoring and resilient agriculture.

39. In the transport sector, the CTFC supervised, among others, the development of a project for deploying a large fleet of electric buses in Santiago de Chile and Bogota, and the application of new forestry monitoring, reporting and verification tools in Brazil. In terms of enhancing climate resilience in the agriculture sector, the CTFC provided financial support for case studies on climate-resilient farming practices.

40. Regarding co-financing, the CTFC managed to raise four times as much funding as initially targeted (USD 227 million versus USD 57 million), mainly provided by IADB (USD 205 million), but also including co-financing from FONTAGRO (USD 1.1 million) and WRI (USD 20 million).

IV. Successes of and lessons learned from project activities

A. Knowledge-building and networking to enhance capacity for climate technology development and transfer

1. Generating and disseminating knowledge

41. All CTFCs have carried out project activities for building and disseminating knowledge, and networking. Communication products and platforms have been created targeting project developers, researchers, financiers, and service and technology suppliers with the aim of enhancing countries' capacity to identify investment opportunities for technology development and transfer for mitigation and adaptation and to improve the business and policy environment for these opportunities.

42. The African CTFC has focused particularly on improving market conditions for adopting climate technologies, including by supporting nine projects carried out in 2017–2018 by research institutes in the project countries (see box 1) aimed at identifying market and institutional barriers to climate technology uptake in sub-Saharan Africa and actions to overcome them, thus supporting the countries in accelerating and scaling up climate technology investment, in the following areas:[30]

[29] A co-financing mechanism created in 1998 for agricultural technology development and transfer in Latin America, the Caribbean and Spain; see https://www.fontagro.org/en/.

[30] See https://www.african-ctc.net/our-activities/component-1-%e2%80%93-knowledge-creation/research-projects/.

(a) Market-based approaches to the diffusion of clean cooking solutions;

(b) Integration of renewable energy technologies in on- and off-grid markets;

(c) Efficient use of climate change adaptation.

43. An important focus of the African CTFC has been improving market, institutional and policy conditions for deploying and diffusing climate technologies in sub-Saharan countries. Such 'first mile' support (e.g. in the form of research projects as shown in box 1) is intended to pave the way for accelerated and scaled-up investment in technology.

Box 1

Research projects supported by the African climate technology transfer and finance centre

The pilot evaluation of the diffusion and use of clean cooking technologies in Lagos involved a pilot study of 30 households in the city to determine the acceptability of blended ethanol and methanol as cooking fuel and their willingness to pay for clean cooking stoves. The results have been used as input to a commercial pilot project (involving diffusion of 2,500 cook stoves) in Nigeria that started in 2018.

The study on the climate and health impacts of scaling up adoption of liquefied petroleum gas for clean cooking through Cameroon's master plan for the gas involved modelling such impacts of the goal in the plan of having, by 2030, 58 per cent of the country's population using it for cooking. It was found that by 2030 this could save about 29,000 lives and avert some 770,000 disability-adjusted life years, as well as leading to emission reductions on account of replacing non-sustainable cooking fuels.

The study on developing an innovative and sustainable market-based system for enhancing diffusion of clean cooking solutions in East Africa involved consideration of barriers to the development of markets for clean cooking in rural and peri-urban households in Kenya, focusing on such aspects as affordability, availability, quality, suitability, awareness and capacity related to market uptake of clean cooking technologies. It was found that 97 per cent of the respondents from rural areas did not use clean cooking solutions compared with 54 per cent from peri-urban areas. The respondents identified affordability (31 per cent), fuel saving (27 per cent), availability (23 per cent) and durability (17 per cent) as the main factors to consider in selecting a type of cook stove.

The research project for exploring hybrid models for universal access to basic solar energy services in informal settlements involved examining case studies from South Africa and Zimbabwe of delivery models for solar home systems to increase access to electricity for low-income urban households, thereby bypassing legal, financial and practical barriers to grid electrification in urban informal settlements.

The focus of the universal electrification development strategies for Ethiopia project was on improving access to electricity and promoting energy security, and it contributed to the design of policies and strategies for on- and off-grid power systems, using the TIMES modelling tool, cost–benefit assessments of hybrid power systems for off-grid rural electrification and relevant capacity-building.

The study on the role of renewable-energy-based off-grid mini-grid systems and service delivery schemes in isolated communities in Ghana examined the impact of such mini-grids on improving energy access and reliability and resulted in actionable recommendations and a policy and business model framework.

The economic assessment of large-power photovoltaic irrigation systems in the Economic Community of West African States (Benin, Burkina Faso, Cabo Verde, Guinea, Liberia, Nigeria and Sierra Leone) involved determining the impact (in terms of net present costs, internal rates of return and levelized costs of energy, etc.) of replacing diesel-powered and grid-powered irrigation systems with solar photovoltaic systems in the seven countries.

The study on African water adaptation through knowledge empowerment explored barriers and enablers in relation to the development and uptake of climate-resilient water management technologies in the cities of Blantyre, Malawi; Harare, Zimbabwe; and Gaborone, Botswana. It focused on specific socioeconomic and spatial contexts in the Global South and concluded that these contexts are often not duly considered in the design of climate-resilient water management technologies.

44. FINTECC has undertaken and disseminated studies on opportunities for investment in renewable energy and energy efficiency technologies in Eastern Europe, Caucasus, Central Asia, and the southern and eastern Mediterranean using, for example, the EBRD Green Technology Selector tool[31] to provide businesses, including local enterprises and banks, with country-specific information on technology products and vendors.

45. FINTECC has been able to improve public and private sector stakeholders' understanding of climate change (including mitigation and adaptation) and the social, environmental and economic performance of climate technologies in a country. Increasingly FINTECC has focused on developing the capacity and skills of local consultants who are helping small businesses and municipal enterprises with technology decision-making.

46. FINTECC has provided, in collaboration with FAO and IEA, basic and intermediate training materials on adaptation to 238 regional consultants (see para. 27 above), which has helped to increase countries' capacity to identify climate-related vulnerabilities, potential adaptation technologies for implementation and (policy and financial) instruments to support market deployment of those technologies.

47. The CTFC for Latin America and the Caribbean strengthened the access of policymakers and private sector stakeholders to information on climate technologies using the knowledge base of its executing agencies. For example, Bariloche Foundation trained researchers and technical experts engaged in the pilot projects carried out by the CTFC; and with the help of FONTAGRO, the CTFC established innovation platforms by convening key actors with a view to creating coalitions and sharing knowledge.

48. Other examples of the CTFC for Latin America and the Caribbean building and disseminating knowledge are:

(a) Strengthening Latin American and Caribbean countries' capacity to manage forest and water resources, reduce deforestation and forest degradation, and conserve biodiversity using forest monitoring tools (see para. 39 above);

(b) Applying the financial model developed by WRI to electric bus fleet projects in Santiago de Chile and Bogota, which has been replicated by WRI in other countries, such as China, Ethiopia, India and Türkiye;

(c) Activities under the project component for developing national policy and institutional capacity (undertaken by the Mexican National Institute of Ecology and Climate Change), including:

(i) Three workshops on climate technologies and technology innovation systems in 2017–2018, attended by 208 government officials from 19 countries;

(ii) Releasing a guidance document of policy recommendations for incorporating environmentally sound technologies into national innovation systems;

(iii) Three regional dialogues on climate change planning and climate technologies in 2018, attended by 193 government representatives from 18 countries;

(d) Publishing a guidebook on climate change planning and environmentally sound technologies.

49. The Asia-Pacific CTFC organized activities for exchanging and disseminating knowledge with a focus on bringing together NDEs and other institutional actors from 17 countries across Asia and the Pacific at meetings of two to three days. By tapping into existing networks such as the South-East and Central Asia Climate Change Networks, the CTFC aimed to facilitate knowledge-sharing on climate technologies among public and private stakeholders in the region.

50. The knowledge-building activities of the Asia-Pacific CTFC helped to raise awareness of technology transfer among national technology focal points, which also supported the operationalization of CTCN activities in the region.

[31] See https://ebrdgeff.com/egypt-gvc/technologys/technology-selector-database/.

2. Networking

51. For networking activities, the CTFCs have been able to tap into existing institutional facilities and networks operated and/or supported by the associated multilateral development banks: the African CTFC engages in the network of Sustainable Energy for All focal points, for example (see para. 21 above).

52. FINTECC has supported regional networking to foster policies and practices in support of climate technology transfer, in collaboration with FAO and IEA. Recently its focus has been on building sustainable networks for small and medium-sized enterprises as their knowledge base of climate-related topics and solutions is generally limited, especially when compared with that of large-scale enterprises.

53. The selection of the executing agencies for the CTFC for Latin America and the Caribbean was guided by an analysis of their networking strength and experience in the areas of energy, transport, forest monitoring and climate-resilient agriculture. The executing agencies held a series of regional workshops on those themes under the auspices of the CTFC. In addition, the activities of the CTFC encouraged different divisions of IADB to strengthen their collaboration on addressing climate technology transfer and sustainability matters.

54. The Asia-Pacific CTFC brought together NDEs and other stakeholders for networking and capacity-building (including via two forums for NDEs in Bangkok in 2015–2016). The CTFC leveraged the operational networks in the region, such as the South-East and Central Asia Climate Change Networks. Through networking activities, the CTFC was able to support implementation of prioritized climate technologies in the region (under UNEP supervision).

B. Mainstreaming climate change mitigation and adaptation and integrating actions into national sustainable development strategies, programmes and policies

55. To enable uptake of technology transfer in sub-Saharan Africa, the African CTFC has provided technical assistance for scaling up technology transfer through policy, institutional and organizational reforms of the enabling environment at national and regional level. Public sector entities in the region can request technical assistance via six preselected consultancy firms, three for mitigation and three for adaptation technologies.

56. Aligning with the action agendas and investment plans of Sustainable Energy for All enabled the African CTFC to support countries in improving their enabling environment for renewable energy and energy efficiency technologies. Such action agendas and investment plans have been concluded with the help of the African CTFC for Angola, Kenya, the United Republic of Tanzania, and Rwanda (action agenda only).[32]

57. A demonstration project for water management for adaptation in Nigeria provides an example of an activity funded through the African CTFC that has eventually been linked to the country's climate policy (see box 2). The project contributed to the water sector being prioritized in the Nigerian NDC. The African CTFC has thus contributed to African countries' national climate strategies under the Convention, such as those for NAPs, NDCs and TNAs.

58. The Asia-Pacific CTFC supported Bhutan, Nepal and Sri Lanka in using the results of their TNA for formulating sectoral and national climate technology investment plans. UNEP facilitated this consideration of TNA results in national plans given its role in both the CTFC and the global TNA project.[33] Moreover, the CTFC helped several countries to identify climate technologies for inclusion in national policies for climate and development such as:[34]

[32] See https://www.se4all-africa.org/.

[33] See https://tech-action.unepccc.org/.

[34] For information on the Asia-Pacific CTFC and its project activities, see https://www.thegef.org/projects-operations/projects/4512 and the terminal evaluation report, available at https://wedocs.unep.org/handle/20.500.11822/32547.

(a) The country partnership strategy of Papua New Guinea (for 2016–2020);

(b) The country strategies and green development policies of Mongolia and Viet Nam;

(c) China's 13th Five-Year Plan and its country partnership strategy;

(d) Bhutan's irrigation master plan (including prioritizing technologies for adaptation);

(e) Bangladesh's efforts to scale up renewable energy technology options, including a pre-feasibility study;

(f) The policy areas of agriculture, natural resources and rural development, energy, transport, water and urban infrastructure in Pakistan.

59. FINTECC has assisted countries in improving their legislative framework and implementation practices for climate technologies, including via sustainable energy action plans, sectoral studies, national sustainable energy market assessments and an integrated set of operational, technical assistance and policy activities.

60. To initiate such assistance, based on a country's technology and support needs, climate technology options are prioritized for the country.[35] This is followed by FINTECC experts assisting the country in identifying policy instruments, such as energy performance standards and climate technology strategies. FINTECC policy support has been provided in Kazakhstan, Ukraine, EBRD 'early transition' countries[36] and countries in the southern and eastern Mediterranean.[37]

61. Under the project component for developing national policy and institutional capacity, the CTFC for Latin America and the Caribbean supported government representatives in the region in climate action planning and policymaking. Subsequently, regional policymakers were supported in formulating policies and action plans for implementing prioritized climate technologies.

C. Piloting and leveraging private and public investment in climate technology in the regions

62. The African CTFC has provided a grant of USD 400,000 for technical support for a project to demonstrate water-filled flood barriers in Nigeria in a pilot district of Lagos with around 5,000 inhabitants. Further financing for replicating the project will be mobilized through the AfDB adaptation benefit mechanism (see box 2).

63. Jointly with the AfDB Water and Sanitation Department, the African CTFC initiated eight projects for adaptation (in Benin, Comoros, Côte d'Ivoire, the Gambia, Madagascar, Senegal, Seychelles, and the countries of the Zambezi watercourse[38]). The CTFC supported the countries in preparing project proposals to ensure that climate change adaptation technologies are mainstreamed in their disaster response and recovery projects.

64. Moreover, the African CTFC has supported feasibility studies and pilot projects for implementing technologies for mitigation and adaptation in the countries, such as providing financial support at the request of the Government of Nigeria for a demonstration project for portable flood dams in Lagos (see box 2).

[35] See https://fintecc.ebrd.com/sites/Satellite?c=Page&cid=1395247816399&pagename=FINTECC%2FPage%2FFINTECC_GenericPage.

[36] Armenia, Azerbaijan, Belarus, Georgia, Kyrgyzstan, Mongolia, Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan.

[37] Egypt, Jordan, Lebanon, Morocco and Tunisia.

[38] Angola, Botswana, Malawi, Mozambique, Namibia, United Republic of Tanzania, Zambia and Zimbabwe.

Box 2
Water-filled flood barrier project in Nigeria under the African climate technology transfer and finance centre

Nigeria prioritized adaptation, including in the water sector, in its NDC. The African CTFC is financing a small-scale, high-impact and highly replicable project in the water sector in Lagos and mobilizing funding for replication through the AfDB adaptation benefit mechanism, whereby the benefits of adaptation action are certified as information for funding partners.

For the flood barrier project, SLAM*DAM* technology is being implemented, which enables installation of dams in districts that are vulnerable to flooding, replacing traditional sandbags with water-filled, flexible, snake-like tubes that function as dams during floods and store water for irrigation during dry season.[a]

[a] See https://www.slamdam.nl/en/.

65. FINTECC has highlighted 14 case studies of providing technical support and incentive grants to countries.[39] In most cases FINTECC support is integrated into a larger financing structure of EBRD in order to leverage the FINTECC contribution with a significantly larger budget.

66. FINTECC support for investments in projects is provided mainly in the area of mitigation, in particular for energy efficiency measures (improving building insulation and implementing modern energy management systems) and renewable energy generation. For example, FINTECC supported an energy efficiency project at a beverage production plant in the Kyrgyz Republic for which EBRD provided EUR 7 million.[40]

67. Other examples of projects carried out under the auspices of FINTECC are installation of a rooftop solar photovoltaic system in Morocco and a geothermal heat pump at a production facility in Georgia. FINTECC supported an adaptation project in Azerbaijan to increase water recovery at a car washing facility in order to cope with potential water deficit.

68. The CTFC for Latin America and the Caribbean developed pilot projects for both mitigation and adaptation. In Mexico a project for local development of wind energy technology was carried out in 2013–2022 with Mexican private companies working on designing and building wind turbines and supplying materials and equipment for the project.[41] The wind turbine development project on Holbox Island had a specific focus on hurricane-proof wind generators, thereby considering potential climate change impacts (and thus creating synergies between mitigation and adaptation).

69. In Chile a pilot project for promoting and developing local solar technologies was implemented in 2013–2020,[42] accompanied by a relevant training programme for electrical engineering schools.

70. The support provided by the CTFC for Latin America and the Caribbean for adaptation targeted the agriculture sector. IADB project co-financing was mobilized via activities of the CTFC executing agency FONTAGRO. In total USD 205 million was mobilized, comprising a USD 55 million IADB loan to Haiti to increase the agricultural revenue and food security of smallholder farmers and a USD 150 million IADB loan for developing sustainable agroforestry in the Dominican Republic.

71. The support under the Asia-Pacific CTFC for investments in climate technology was provided mainly through ADB funding mechanisms. In total USD 873 million was mobilized, with ADB financing of USD 249 million for climate-focused venture

[39] See https://fintecc.ebrd.com/case-studies.
[40] The financing was provided together with a FINTECC investment grant for the purchase of building insulation, steam boilers, carbon dioxide capture technology and an energy management system.
[41] GEF, 2022, Update on FY22 technology transfer activities for the GEF report to COP27, 4132_2022_Poznan_IDB_Mexico.
[42] GEF, 2021, Update on FY21 technology transfer activities for the GEF report to COP26, 4136_2021_Poznan_IDB_Chile.

capital/private equity funds leveraging USD 624 million of third-party capital. Public sector investments in climate-related projects in Cambodia, Fiji, Indonesia, Tajikistan, Tonga and Viet Nam (three projects for mitigation, five for adaptation, and two for both mitigation and adaptation) were supported.[43]

V. Challenges for project activities

72. The work of the CTFCs has highlighted challenges with respect to the existing environment for technology transfer, including markets, targeted stakeholders, human resources, and specific regional and national political, social and cultural issues.

73. The work of the CTFCs has been driven to some extent by the agendas of existing programmes and networks for climate and development they have strong links with or have collaborated with, including those operated by the associated multilateral development banks. Consequently, the focus of the activities of the CTFCs, at least initially, was on technologies for mitigation, also owing to the fact that, when the CTFCs were designed (in 2010–2014), adaptation was an emerging area often disregarded within the development agenda.

74. Since the launch of the CTFCs, however, climate change adaptation has become an increasingly urgent policy response to combat climate change impacts and reduce social vulnerabilities. For instance, according to the African CTFC, most of its allocated adaptation resources have been committed in the last two to three years.

75. During the initiation stage of the CTFCs, IADB noted that climate technology transfer was not a priority reason for many countries to take a loan from the Bank. In that sense, the capacity-building and budget provided by the CTFC for Latin America and the Caribbean helped to enhance the interest of countries in promoting technology transfer projects.

76. In terms of capacity challenges, the African CTFC, having been cautious with issuing calls for proposals in order not to exceed its capacity, received many more expressions of interest in project activities than initially expected, which exhausted its human resources and resulted in delays in disbursing allocated funding. AfDB can step in and assist the process of reviewing proposals for projects, but this is at the risk of crowding out the Bank's own capacity. With the engagement of an adaptation specialist, the CTFC was able to accelerate activities for adaptation.

77. There has been no indication of close collaboration between the CTFCs to exchange knowledge and experience. While increased cooperation could be desirable in theory, there are limitations in terms of budget, geography, and organizational and logistical issues.

78. Collaboration with the CTCN varies among the CTFCs. While the Asia-Pacific CTFC regularly collaborated with the CTCN, the collaboration of the African CTFC with the CTCN remains limited to attending CTCN-organized workshops in the region.

79. The two still operational CTFCs, the African CTFC and FINTECC, as well as ongoing projects under the other CTFCs, have had to cope with the impacts of the coronavirus disease 2019 pandemic, which resulted in, among other things, slower responses from national focal points, resulting in delays to procurement and disbursement of funds.

80. In the case of FINTECC, the pandemic had a particularly strong impact on its key target group of small and medium-sized enterprises, although they (except for those in the tourism sector) were able, according to FINTECC, to adapt to the circumstances and restrictions over time.

81. FINTECC has also experienced substantial challenges due to the conflict in Ukraine. A decrease in capital investments by FINTECC and other investors in Ukraine and other FINTECC countries near Ukraine, such as Georgia and the Republic of Moldova, can be observed. In Belarus, a former recipient of support, FINTECC stopped its operations. Concerning Ukraine in particular, Ukrainian businesses continue to be supported with

[43] As footnote 27 above.

technical assistance, such as through FINTECC developing climate technology feasibility studies.

VI. Key findings from project activities

82. The **three pillars of CTFC project activities** are knowledge-building and networking to enhance capacity for climate technology development and transfer, mainstreaming climate technologies in national sustainable development strategies and policies and facilitating and supporting climate technology investment in the countries concerned and piloting and leveraging private and public investment in climate technology in the regions.

83. By **enhancing developing countries' awareness and knowledge of climate technology**, including costs and requirements for implementation, the CTFCs have strengthened the countries' capacity and access to key resources, particularly finance, for implementing climate technologies.

84. The CTFCs have also **strengthened developing countries' capacity to mainstream climate technologies** in their sustainable development strategies and policies, which has supported establishment of interlinkages of CTFC work with other UNFCCC processes, such as for TNAs, NAPs and NDCs. Furthermore, the CTFCs have stimulated multilateral development organizations to go beyond their 'business as usual' activities and also consider climate technology transfer aspects within their portfolio of activities.

85. Through interlinkages with relevant regional networks and by providing co-financing, the CTFCs have contributed to leveraging investment in climate projects, which has generally **reduced project investment risk**. Investment support has been provided through the CTFCs in various forms, such as in-kind support (staff, government facilities, etc.) and funding, by, for example, the government of the country receiving the investment support, agencies linked to the CTFCs and the private sector (e.g. investors in wind farms).

86. The CTFCs have **increased their focus on adaptation**. While initially the majority of funds were allocated to mitigation projects, more recently there has been a significant shift in allocation of resources towards adaptation, which reflects the responsiveness of the CTFCs to the growing interest in adaptation in international climate policy processes.

87. The CTFCs, especially the African CTFC and FINTECC, which are still in operation, have had to **cope with delays due to the pandemic**, which had a negative impact on stakeholder responsiveness, particularly in the case of small and medium-sized enterprises.

88. The CTFCs have been piloted under the PSP. Considering the current GEF priorities of climate technology development and transfer and the funding windows provided through the eighth GEF replenishment, there are opportunities for countries to build on the work carried out by the CTFC and apply for GEF support for promoting innovation and enabling policies for development and transfer of technologies for mitigation and adaptation with systemic impacts.