



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET



IMPLEMENTING THE
**POZNAN STRATEGIC
AND LONG-TERM
PROGRAMS**

ON TECHNOLOGY TRANSFER



Foreword



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Technology transfer plays an increasingly critical role in an effective global response to climate change and other environmental challenges. Promoting the transfer of environmentally sound technologies (ESTs) and best practices to developing and transition countries is a key priority for *all* countries—developed as well as developing—that seek to mitigate climate change impacts and build resilience.

Technology transfer is embedded in the fabric of the United Nations Framework Convention on Climate Change (UNFCCC). Parties agreed in 2010 at the Cancun climate change conference to establish and operationalize a Technology Mechanism within the Convention. Its aim is to facilitate the implementation of enhanced action on technology development and transfer in order to support action on mitigation and adaptation to climate change.

The Global Environment Facility (GEF) is one of the entities entrusted to provide financial resources to assist developing and transition countries in implementing the UNFCCC. The GEF helps to catalyze the transfer of climate-friendly ESTs to meet a broad variety of development priorities in a country-driven manner.

The GEF supports piloting of innovative approaches and fosters adoption of technologies and practices, through the removal of policy, regulatory, and technical barriers. The GEF support encompasses energy efficiency, renewable energy, sustainable transport, and sustainable management of land use, land-use change, and forestry (LULUCF). The GEF also supports technology transfer for adaptation in areas such as water resource management, agriculture, and early warning systems.

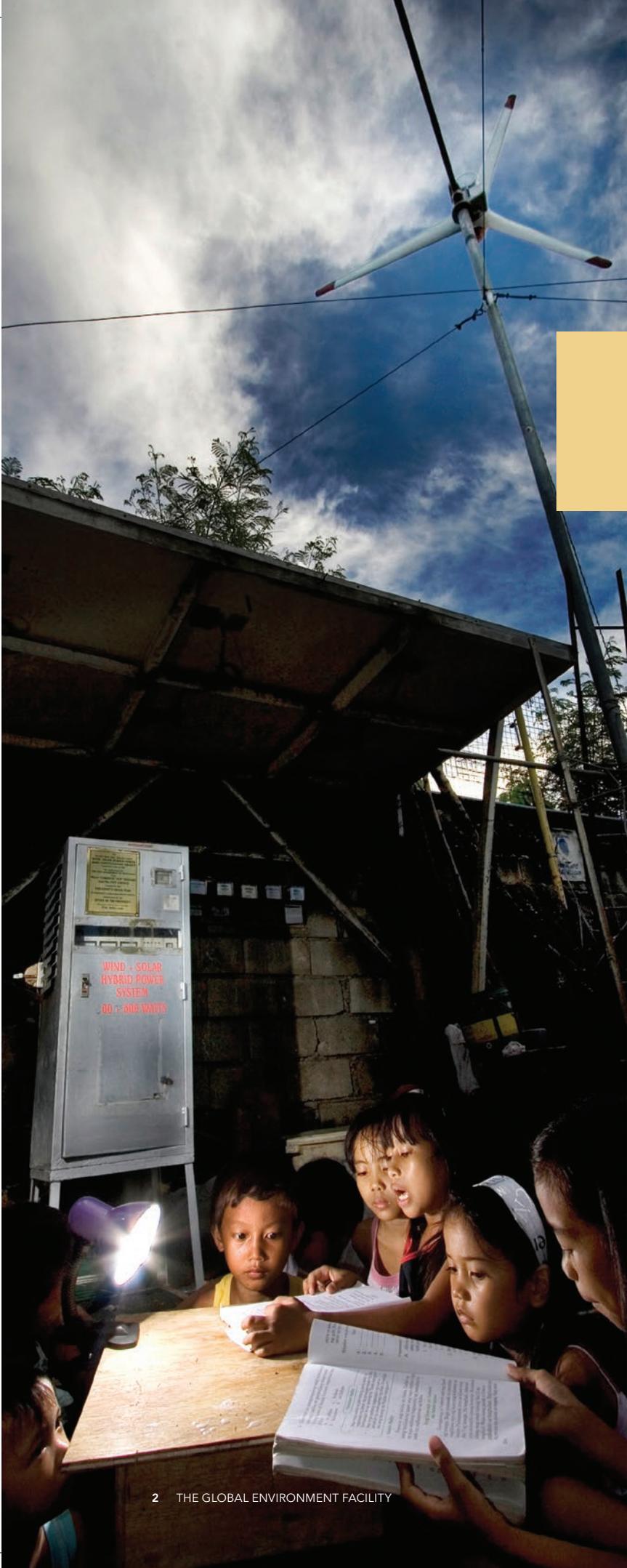
The GEF has allocated US\$3.6 billion to support climate change mitigation activities in developing and transition countries and has leveraged \$23.7 billion in additional co-financing. Significant resources have also been allocated to adaptation technology transfer. Today, the GEF is a leading public-sector funding source for the transfer of ESTs, supporting technology transfer activities in almost 168 developing and transition countries.

In response to a Bali UNFCCC conference decision from 2007, the GEF launched the Poznan Strategic Program on Technology Transfer in 2008. This program supports the following activities: (i) Conduct technology needs assessments; (ii) Support pilot priority technology projects linked to technology needs assessments; and (iii) Disseminate GEF experience and successfully demonstrated ESTs.

Parties welcomed the Poznan Strategic Program, and also requested the GEF to consider its long-term implementation. The Long-Term Program on Technology Transfer was developed and submitted to the Cancun climate change conference in 2010. It seeks to scale up technology transfer activities supported under the original Poznan Program. This Long-Term Program includes the following elements: (i) Support for climate technology centers and a climate technology network; (ii) Piloting priority technology projects to foster innovation and investments; (iii) Public-private partnership for technology transfer; (iv) Technology needs assessments; and (v) GEF as a catalytic supporting institution for technology transfer.

In GEF-5 (2010 to 2014), we have intensified our efforts to promote innovation and technology transfer. The GEF is making longer-term investments needed to scale up the effort towards transformative change. The GEF is also ready to continue to support the operationalization and activities of the Climate Technology Center and Network for Technology Transfer under the Convention, in line with GEF procedures. The GEF is providing funding for technology needs assessments and other enabling activities. This brochure provides a snapshot of our approach to date on promoting technology transfer, with new insights. Updates on the original Poznan Program and the Long-Term Program are also featured.

I hope this brochure will inspire you to enhance your engagement in climate technology transfer and innovation, to move towards sustainable development with the GEF as your partner of choice.



Introduction: Technology Transfer and GEF Support

What is technology transfer and why is it important?

Developing, demonstrating, deploying, and diffusing environmentally sound technologies (ESTs) are critical activities on a path toward an effective global response to environmental challenges. Technology is especially central to the climate change challenge. In combination with the choices we make individually and the policy instruments that may influence these choices, technology determines the amount of greenhouse gases (GHGs) we emit, how we can reduce these emissions, and how we can adapt to climate change impacts we cannot avoid. In essence, technology and its transfer serve as both the basis and catalyst for a global shift toward low-carbon development. Simply put, the global climate change challenge cannot be addressed without technology transfer.

The transfer of ESTs and know-how, as enshrined in Article 4.5 of the United Nations Framework Convention on Climate Change (UNFCCC), is one of the key means to reduce (or slow the growth in) GHG emissions and to stabilize their concentrations.¹ Also, technological change has the potential to significantly reduce the cost of options to meet the climate change goals. Technology transfer creates opportunities for economic growth:

¹ Article 4.5 of the Convention states: "The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention."

innovation is a foundation for industrial development, helping to create or expand markets for products and services, and generating jobs.

The objective of this brochure is to present an updated description of the Global Environment Facility (GEF) support to technology transfer and of the implementation status of the Poznan and the Long-Term Programs on technology transfer.

What role does the GEF play in technology transfer?

As an operating entity of the financial mechanism of the UNFCCC, the GEF has a mandate to finance the transfer of ESTs in the context of both mitigation and adaptation, with ongoing guidance from the Conference of the Parties (COP). The GEF Trust Fund is primarily programmed to support mitigation measures. The GEF's climate change strategy under GEF-5 (2010–2014) focuses, as a whole, on promoting technology transfer at various stages of the technology development cycle, from demonstration of innovative emerging low-carbon technologies to diffusion of commercially proven environmentally sound technologies (ESTs) and practices. The GEF also manages two special funds under the UNFCCC that each address adaptation: the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). The SCCF has as one of its primary aims the transfer of ESTs to developing countries—for adaptation and mitigation. The LDCF also supports technology transfer that relates to urgent and immediate adaptation needs.

During the first two years of GEF-5 (2010–2012), the GEF has invested more than US\$1 billion to help pilot priority technology projects fostering innovation and leveraged investments. 85 projects under the GEF Trust fund were

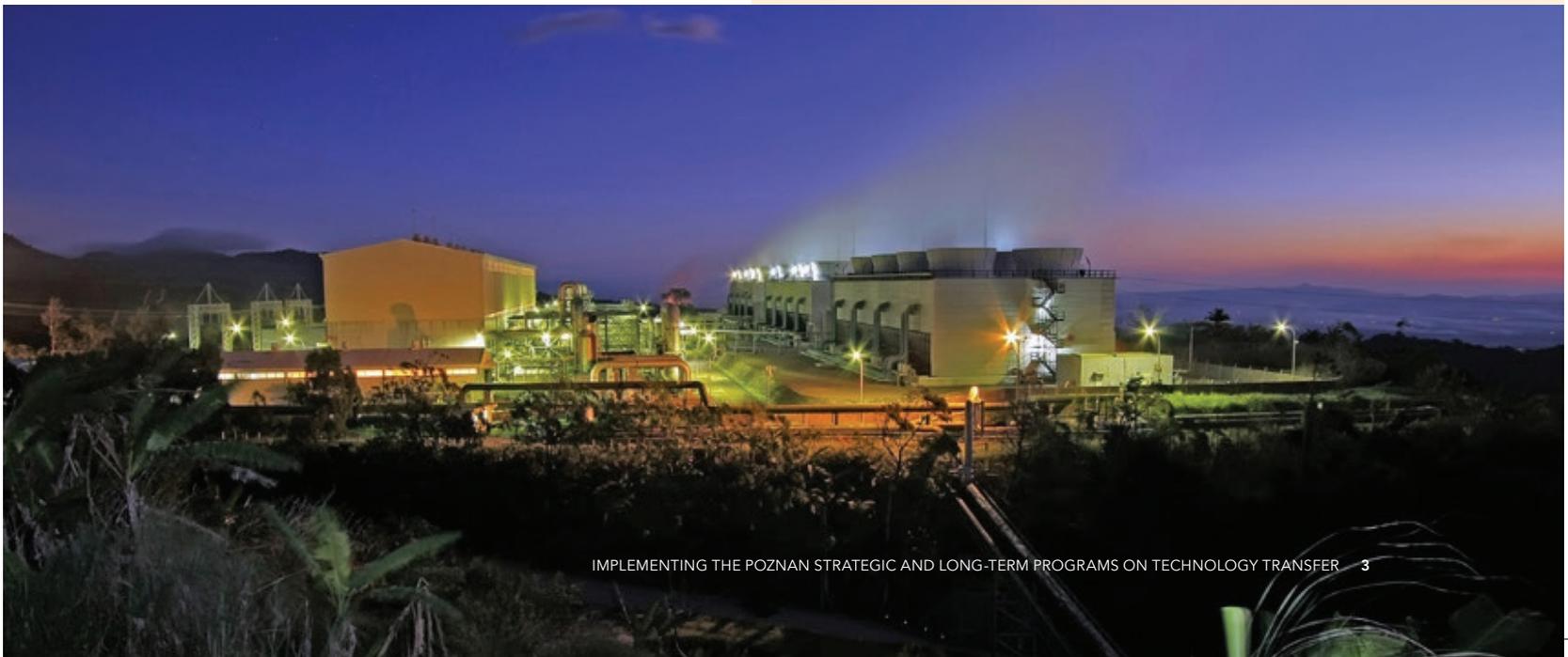
BOX A TECHNOLOGY TRANSFER DEFINITION

While there are many definitions of technology transfer, the GEF has adopted the concept of technology transfer as defined by the Intergovernmental Panel on Climate Change (IPCC) and embodied in the UNFCCC technology transfer framework. Technology transfer is defined 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 organization (NGOs) and research/ education institutions...

...the broad and inclusive term “transfer” encompasses diffusion of technologies and technology cooperation across and within countries. It covers technology transfer processes between developed countries, developing countries and countries with economies in transition, amongst developed countries, amongst developing countries, and amongst countries with economies in transition. It comprises the process of learning to understand, utilize and replicate the technology, including the capacity to choose and adapt to local conditions and integrate it with indigenous technologies (Metz et al. 2001).¹

This definition includes a wide range of activities and extends to a broad array of institutions. The COP established the Expert Group on Technology Transfer (EGTT) under the Subsidiary Body for Scientific and Technological Advice (SBSTA), which defined the following five-part framework for meaningful and effective actions to enhance the implementation of technology transfer: technology needs and needs assessments; technology information; enabling environment; capacity building; and mechanisms for technology transfer.



approved, with \$835.6 million of GEF funding and \$5.9 billion in co-financing. Among these, 19 projects address the promotion and transfer of innovative low-carbon technologies, while 66 aim at market transformation, which lays the groundwork and encourages uptake of specific technologies. Through its management of the LDCF and SCCF, the GEF has also approved 60 projects to date with either a focus or distinct components on transferring technology, out of 117 adaptation projects totaling \$479.5 million of GEF funding.

The GEF's strategic approach to technology transfer is regularly examined and modified, as appropriate, to improve its effectiveness and scope in response to changing needs and funding levels. The GEF's programming in climate change and its support for technology transfer have evolved from the GEF's early pilot phase (1991–1994) to GEF-5 (2010–2014), as shown in Figure 1. Establishment of enabling policy environments is of importance to the GEF's work in funding pilot technology and investment projects. The GEF works with countries to build legal and regulatory landscapes that actively encourage the adoption of climate-friendly technologies and practices (a key step toward transforming markets). Ongoing commitments by the GEF and its partners help countries further integrate newly demonstrated technologies into their wider economies—another element for successful technology transfer.

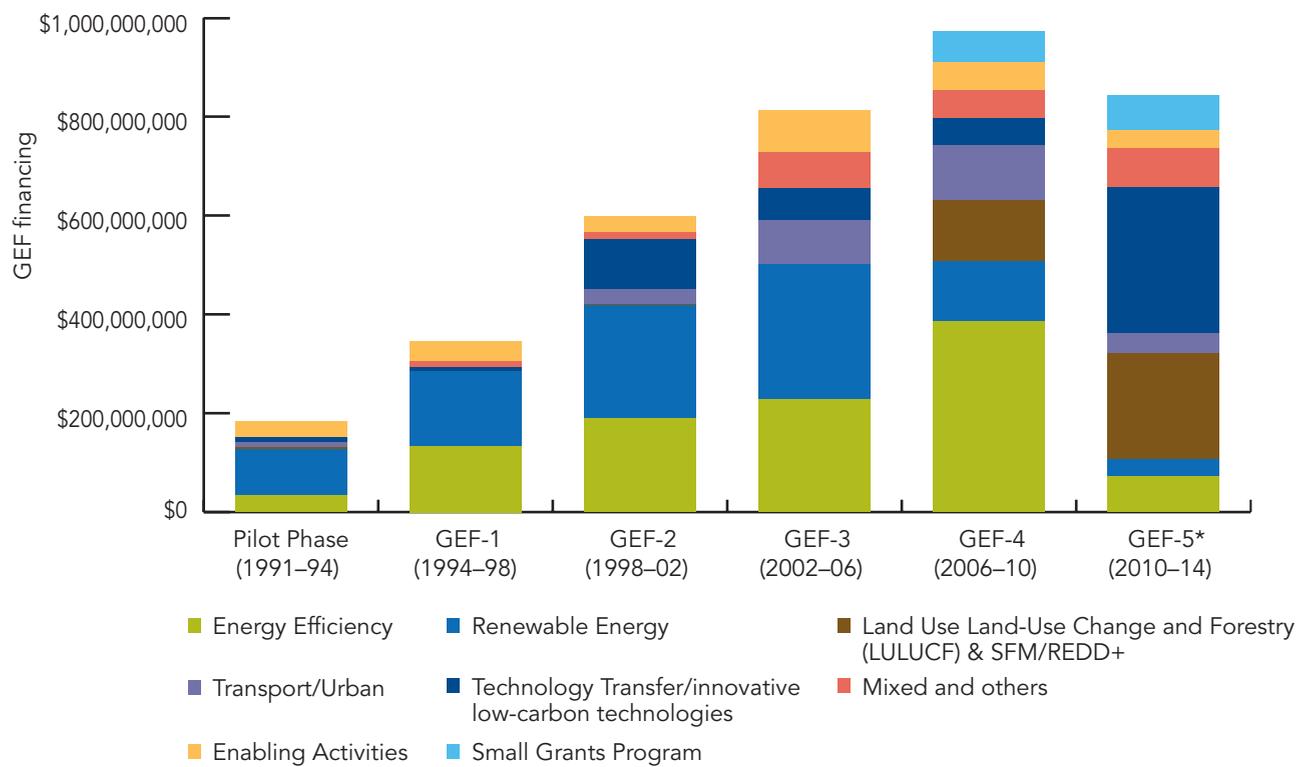
The GEF experiences leading up to GEF-4 had generated the following observations about technology transfer to inform subsequent programming:

- Technology is transferred primarily through markets, and barriers to the efficient operation of those markets must be removed systematically;
- Technology transfer is not a single event or activity but a long-term engagement, during which partnerships and cooperation, often requiring time to develop and mature, are mandatory for the successful development, transfer, and dissemination of technologies; and
- Technology transfer requires a comprehensive approach, incorporating capacity building at all relevant levels.

These observations provided important insights into developing a strategic program on technology transfer, which is described in the next section.

Under GEF-5 (2010–2014), the pledged funding level for the climate change mitigation program has expanded to approximately \$1.4 billion, and the climate change strategy embraces technology transfer as a priority, with the entire portfolio supporting it directly or indirectly. The GEF-5 programming is also described in this document.

FIGURE 1 GEF FINANCING IN CLIMATE CHANGE FROM PILOT PHASE TO THE MIDDLE OF GEF-5 (GEF 2012b*)



*For GEF-5, the figures only account for half of the 4-year phase



Safe maintenance of hydrofluorocarbon (HFC)-free energy efficient cooling system in the Russian Federation as part of the Poznan Strategic Program on Technology Transfer pilot project, implemented by the United Nations Industrial Development Organization (UNIDO).

From the Poznan Strategic Program on Technology Transfer to the Long-Term Program on Technology Transfer

In November 2008, the GEF Council and the LDCF/SCCF Council approved the new *Strategic Program on Technology Transfer*. This Program was developed in response to the 13th Conference of the Parties (COP 13) to the UNFCCC Decision 4/CP.13, which requested the GEF to elaborate a strategic program for scaling up investment in technology transfer to help developing countries address their needs for ESTs.

The 14th Session of the Conference of the Parties (COP 14) in 2008 welcomed the GEF's Strategic Program on Technology Transfer, renaming it the Poznan Strategic Program on Technology Transfer in its Decision 2/CP.14.

The Poznan Strategic Program established the following three funding windows within the GEF in support of technology transfer:

- Conduct Technology Needs Assessments (TNAs);
- Pilot priority technology projects linked to TNAs; and
- Disseminate GEF experience and successfully demonstrated ESTs.

The total funding level for the Poznan Strategic Program was \$50 million, including \$35 million from the GEF Trust Fund from GEF-4 and \$15 million from the SCCF.

Parties also requested the GEF (through Decision 2/CP.14) to consider the long-term implementation of the strategic program. In response, the GEF then submitted a Long-Term Program on Technology Transfer to COP 16. The GEF submission included the following elements to further scale up investment in ESTs in developing countries that were also consistent with its GEF-5 climate change strategy:

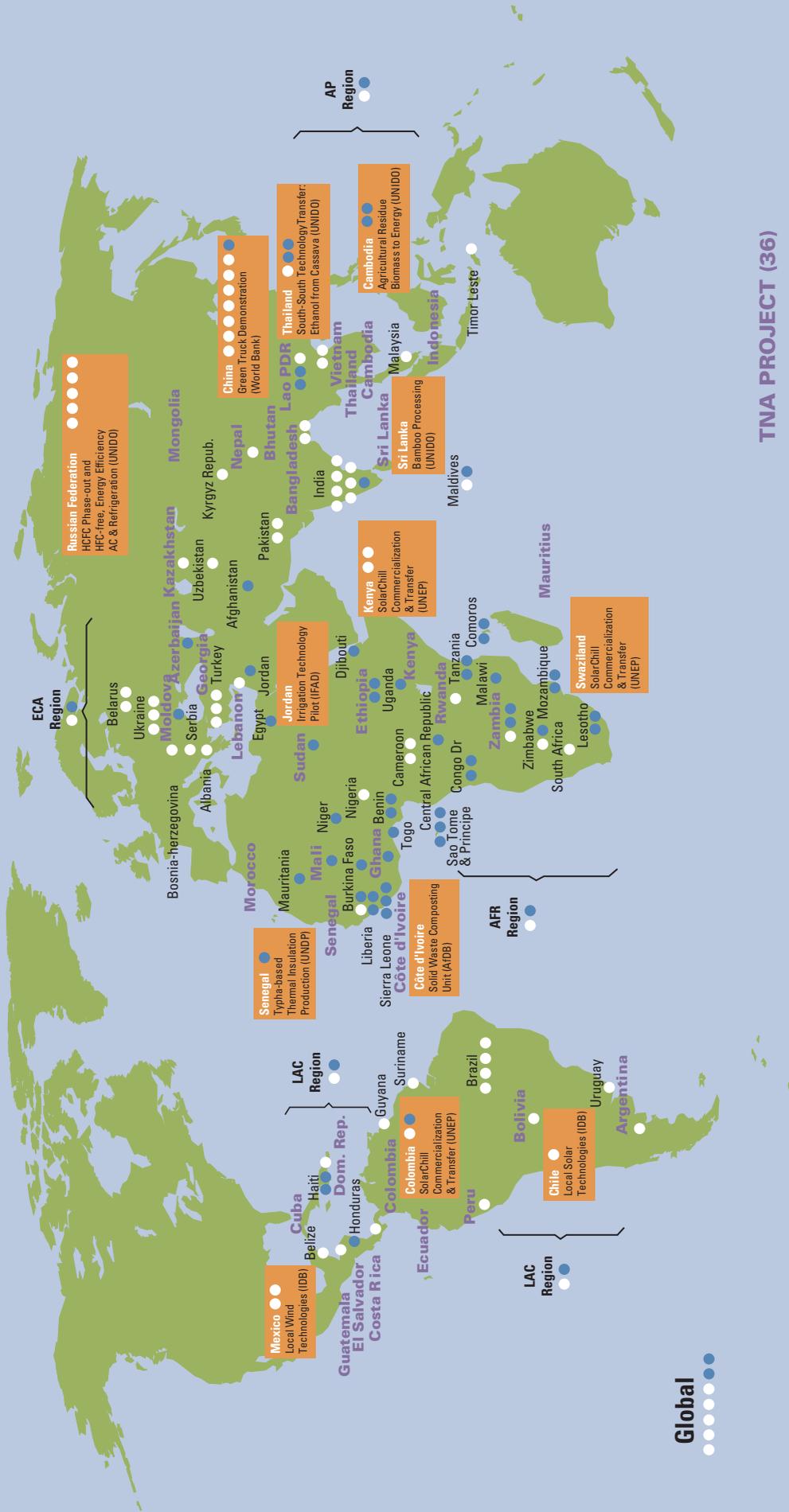
- Support for climate technology centers and a climate technology network;
- Piloting priority technology projects to foster innovation and investments;
- Public-private partnerships (PPPs) for technology transfer;
- Technology needs assessments (TNAs); and
- GEF as a catalytic supporting institution for technology transfer.

Three of these elements (piloting projects, TNAs, and the last one on outreach) are a direct continuation and scaling up of the initial Poznan Strategic Program. The other two elements (support for Climate Technology Centers and Networks and PPP) are new, underlining the continuous effort by the GEF to find innovative ways to support greater technology transfer and to respond to COP guidance. The total funding level of the GEF in line with the Long-Term Program on Technology Transfer reaches close to \$1 billion, including \$827.8 million from the GEF Trust Fund from GEF-5 and \$240 million from the LDCF and the SCCF (including \$168 million from the LDCF, \$71 million from the SCCF).

The following sections present the activities undertaken on each of these five elements under both the Poznan Strategic Program and the Long-Term Program on Technology Transfer.



FIGURE 2 COUNTRIES PARTICIPATING IN THE POZNAN STRATEGIC PROGRAM AND THE LONG-TERM PROGRAM ON TECHNOLOGY TRANSFER



TNA PROJECT (36)

POZNAN PROGRAM PILOT PROJECTS (11)

Long-Term Program Technology Projects

- Adaptation (57)
- Mitigation (85)



Technology Needs Assessments

A TNA is a country-driven activity to assist in identifying and analyzing priority technology needs for mitigating and adapting to climate change, particularly in developing countries. Such analysis can form the basis for developing portfolios of EST projects and programs that will facilitate the transfer of both technologies and know-how, in accordance with Article 4.5 of the Convention.

The TNAs also offer an opportunity, under both the Poznan and the Long-Term Programs, to track evolving needs for new equipment, techniques, knowledge, and skills for mitigating GHG emissions and for reducing vulnerability to climate change. The goal of this GEF-supported global program is to enable all parties to go beyond identifying technology needs to developing national technology action plans (TAPs) for prioritized technologies that reduce GHG emissions, support adaptation to climate change, and are consistent with national development objectives.

TNA support within the Poznan Strategic Program

This GEF-supported TNA project is executed and implemented by the United Nations Environment Programme (UNEP). The project concept was approved in April 2009 and launched in November 2009 as part of the Poznan Strategic Program. Its expected completion has been extended to April 2013 to enable all or most of the countries to complete their assessments and to deliver their outputs. The GEF funding for the project is

\$9 million (SCCF funding), with co-financing adding approximately \$2.85 million.

The project has the following three components:

- Support the development of TNAs in 36 developing countries or, where these have already been prepared, make the TNAs more strategic and useful in an operational sense;
- Develop appropriate decision-support tools and provide the technology information needed for preparation of TNAs and TAPs; and
- Establish a mechanism that facilitates cooperative sharing of TNA and TAP experiences, thereby fostering implementation of identified measures.

The project uses the methodologies described in the updated *TNA Handbook*, as indicated in COP decision 2/CP.14. Simultaneously, it is receiving feedback through an iterative process involving project partners to fine tune these methodologies.

Thirty-six countries are participating in the TNA project:

- **Africa (11):** Cote d'Ivoire, Ethiopia, Kenya, Ghana, Mali, Morocco, Mauritius, Rwanda, Senegal, Sudan, Zambia;
- **Asia and Europe (15):** Azerbaijan, Bangladesh, Bhutan, Cambodia, Georgia, Indonesia, Kazakhstan, Lao PDR, Lebanon, Moldova, Mongolia, Nepal, Sri Lanka, Thailand, Vietnam; and
- **Latin America and the Caribbean (10):** Argentina, Bolivia, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Peru.

Draft TNA reports were submitted by 12 countries in 2011 (Bangladesh, Cambodia, Costa Rica, Cote d'Ivoire, Georgia, Indonesia, Mali, Morocco, Peru, Senegal, Thailand, and Vietnam). The TAPs were submitted by six countries (Costa Rica, Cote d'Ivoire, Indonesia, Morocco, Mali, and Thailand). The TNAs and TAPs are recognized as contributing to existing national policies, plans, and strategies, including Nationally Appropriate Mitigation Actions (NAMAs), low-carbon development strategies, and the Millennium Development Goals. Linkages between the TNA Project and other reporting activities under the UNFCCC, such as National Communications, have also been strengthened.

Building on a foundation established in many countries, technical support for carrying out TNAs is underway. Two rounds of regional capacity-building workshops for countries were held between September 2010 and February 2012 in Africa, Asia, and Latin America. The objective of

the workshops was to build the capacity of country teams to conduct high-quality TNAs. Topics covered included: methodology and tools for prioritization of technologies; multi-criteria analysis; financial assessments of technologies; and facilitation of effective stakeholder consultation.

The updated *TNA Handbook*, published by the United Nations Development Programme (UNDP), has been shared with country teams and is being used as the basic resource document on a general methodology for sector prioritization. A new guidebook on how to perform barrier analysis and develop enabling frameworks has also been developed to supplement the *TNA Handbook*. A draft version of the Handbook was used for first-round countries and, based on this experience, a final handbook was published in January 2012.

The project published other materials on TNA practice. Three guidebooks on adaptation TNAs and three on mitigation in different sectors were developed and published. Another guidebook on mitigation in the building sector was released in August 2012. Also, two finance guidebooks, one for mitigation projects and one for adaptation projects, were published in July 2012, and have been widely disseminated at the Experience Sharing Workshop in Bangkok, Thailand in September 2012.

A series of case studies titled "Technology Transfer Perspectives", illustrating technology for adaptation and for renewable energy, was first published in November 2011.

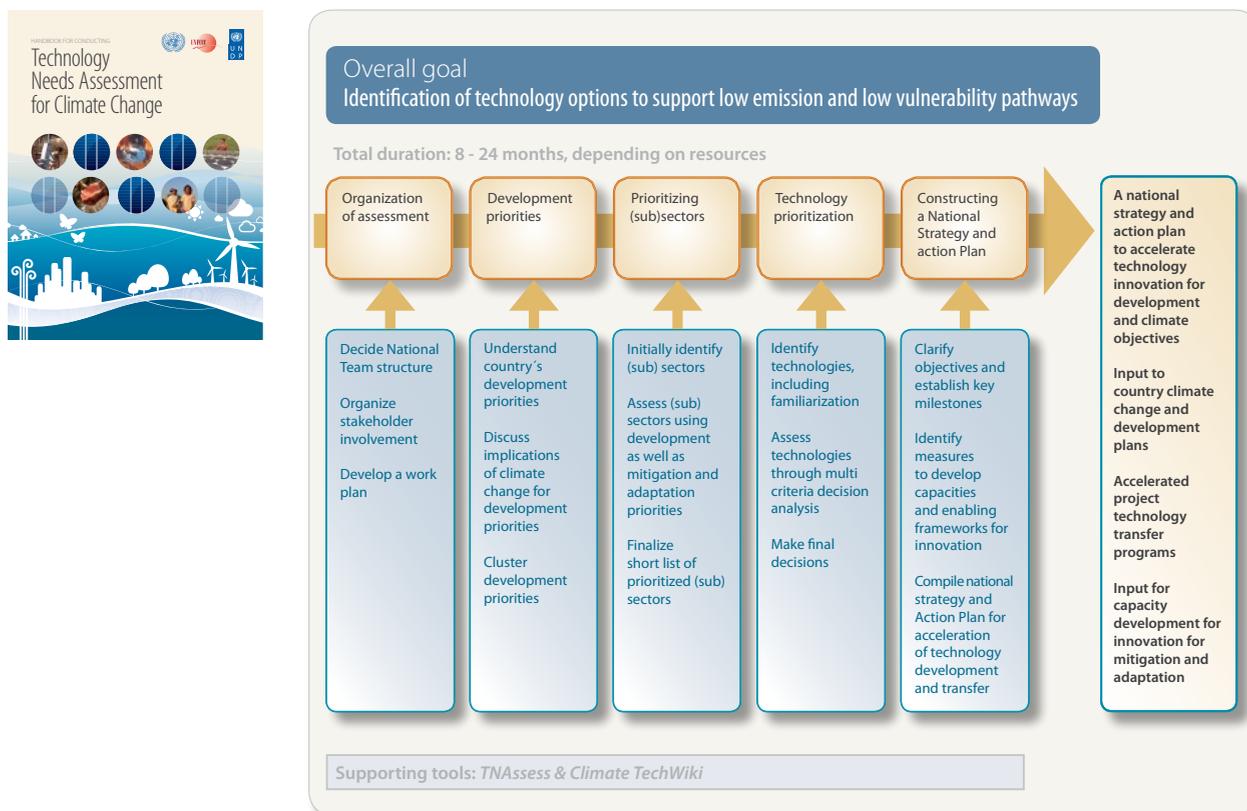
The above mentioned publications are available from the project website, <http://www.tech-action.org>.

The first project newsletter ("TNA Newsletter"), aimed at keeping countries and other stakeholders informed of the project's progress and at sharing experiences, was published in June 2011. The second newsletter was released in October 2011; the third in November 2011 (which was distributed at COP 17); and the fourth in May 2012.

Experience so far shows that:

- High-level political support is crucial for TNA implementation and sustained momentum against a backdrop of often competing initiatives in many countries; in addition, regular project updates delivered to political and technical actors are needed to increase political buy-in.
- Stakeholder engagement and commitment to the TNA process tends to be high when there is a strong signal from donors regarding the availability of financing for the TAP, National Adaptation Programme of Action (NAPA), and NAMA or for prioritized technologies.

FIGURE 3 TNA HANDBOOK AND ASSESSMENT PROCESS (UNDP 2010)



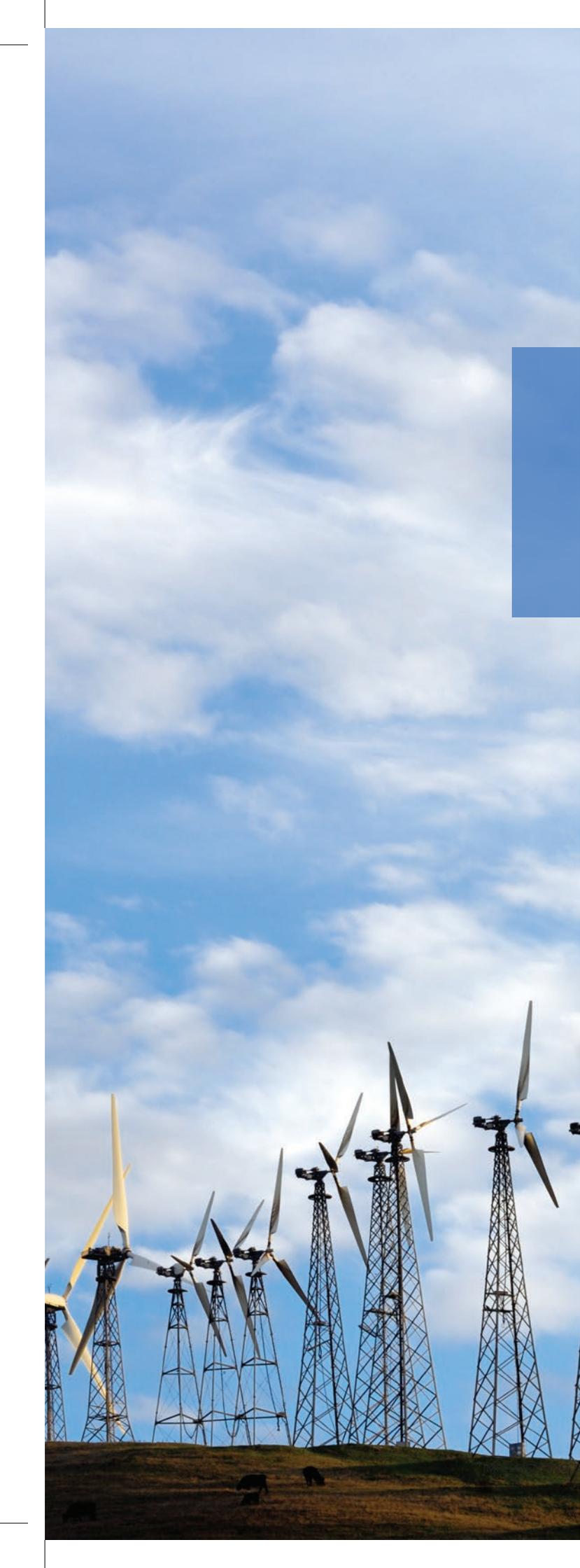
Source: <http://unfccc.int/ttclear/jsp/TNAHandbook.jsp>

- Efforts should continue to explore and take advantage of synergies between TNA-TAP processes, on one hand, and existing efforts in countries such as NAMAs, National Communications, and specific technology transfer projects on the other, while reaching out to new initiatives such as the Climate Technology Center and Network of the UNFCCC.
- Creating an efficient mechanism delivering highly targeted information about real funding opportunities linked to prioritized technologies is essential.

TNA support within the Long-Term Program

The project approach of the TNA global project implemented by UNEP complements and is compatible with individual country-level TNA projects outside the Poznan Program. The progress achieved under the Poznan Strategic Program in developing TNAs has highlighted the need to go beyond current practices to

catalyze investments in technology transfer. The GEF is ready to support additional TNAs focusing on low- and medium-income countries, taking into consideration lessons learned from the ongoing Poznan-supported TNA project implemented by UNEP. Countries that wish to develop more in-depth and extensive analysis to facilitate technology transfer have been invited to do so under their GEF national resource allocation. As an illustration of such support, the GEF Council approved in February 2012 an innovative project in India that combines a National Communication, a Biannual Update Report, and a TNA. The project will be implemented by UNDP. In a similar spirit of innovation, a large-scale TNA project in China implemented by the World Bank was endorsed by the GEF CEO in 2012. This project combines extensive sectoral TNAs with pilot implementation and monitoring of activities targeting prioritized climate technologies, particularly in energy efficiency. Going beyond technology identification, the project will pursue pilot activities to operationalize key assessment findings. Specifically, programs that target and reduce barriers to diffusion of priority technologies will be designed and potentially launched on a pilot basis.



Piloting Priority Technology Projects to Foster Innovation and Investments

Technology Transfer Pilot Projects within the Poznan Strategic Program

Within the Poznan Strategic Program on Technology Transfer, a GEF funding window was created to finance pilot projects that support the deployment, diffusion, and transfer of technologies that are identified as national priorities through different means, including TNAs, National Communications, and others.

The GEF organized a call for proposals for technology transfer pilot projects. In addition to the standard criteria for evaluating GEF climate change projects, the call for proposals placed emphasis on, among other things: consistency of targeted technology with national priorities; innovative technologies and mechanisms for technology transfer; highly leveraged projects, including investments from both the public and the private sector; and South-South technology transfer and international collaborative projects.

Fourteen proposals were selected out of 39 submissions, covering 16 countries supported by six GEF Agencies. The selected projects are summarized in Table 1. During the call for proposals, only one adaptation proposal was received. This proposal was funded, along with other proposals that include adaptation elements. Total GEF

Trust Fund and SCCF-B² funding for the 14 pilot projects amounts to \$58 million. Co-financing for these projects totals more than \$195 million.

The diverse technologies targeted by these projects address both mitigation and adaptation. The projects address the following fields:

- **Renewable energy:** solar, biomass, and wind
- **Energy efficiency:** construction and insulation materials, such as bamboo and typha; both efficient and hydrofluorocarbon-free appliances
- **Transport:** green trucks
- **Waste management:** solid waste composting for energy recovery
- **Water management:** membrane drip irrigation.

As of August 2012, GEF Agencies charged with implementing the technology transfer pilots have reported progress in project development and implementation:

- Nine projects have been endorsed by the GEF CEO and are progressing in project implementation.
- One project is undergoing preparation for CEO endorsement by the GEF Agency and by the country official.
- One project was re-submitted by another Agency, and was approved by the GEF Council in November 2011. It is currently undergoing preparation for endorsement by the GEF CEO.
- Three projects were cancelled upon request of the GEF Agencies and/or of the concerned national government.

Short descriptions of each pilot project are provided in this publication, along with information on the projects' implementation status and experience gained up to this stage.

In addition to conferring a variety of benefits within each country, these pilot projects will enable the GEF to explore ways to strengthen the linkages between technology needs, priority identification exercises, and project development. Practical experience gained from these projects should help all GEF partners move toward a more comprehensive strategy and toward more focused technology programming in the future.

² SCCF-B is the Technology Transfer window of the SCCF.

CAMBODIA—UTILIZING AGRICULTURAL RESIDUES FOR POWER GENERATION

| | |
|---------------------------------|--|
| Project Title: | Climate Change Related Technology Transfer for Cambodia: Using Agricultural Residue Biomass for Sustainable Energy Solutions |
| GEF Agency: | UNIDO |
| GEF Financing: | \$1,947,000 |
| Co-financing: | \$4,565,000 total |
| Public Sector: | \$565,000 |
| Private Sector: | \$4,000,000 |
| Dates of Implementation: | 2011–2015 |

Project overview

Cambodia has significant potential biomass energy resources from agricultural residues, including rice husk, rice straw, palm oil extraction waste, and cashew nut shells, in addition to standing biomass resources. The estimated potential energy generation from waste biomass is substantial, at nearly 19,000 gigawatt hour (GWh) per year. As Cambodia is dependent on imported fossil fuel, a strategy that combines energy efficiency with low carbon alternative technologies offers a comprehensive solution for the country to achieve the twin goals of energy security and sustainable energy solutions. The importance of using locally available renewable sources of energy has been recognized in Cambodia's TNA, National Communication, and national policy.

The objective of this project is to bring about the transfer of sustainable, efficient, cost-effective, and environmentally friendly (low-carbon) agro-waste biomass energy systems to replace fossil fuel-powered generators and boilers for power and thermal energy applications. The project uses an integrated approach, combining interventions at the policy level, in the market place, and on the shop floor. Specific activities include: operation of two pilot biomass plants; capacity building and tool development for technology adaptation and transfer; strengthening of the institutional framework; scaling up biomass technologies in Cambodia through market creation; and establishment of policies and regulatory frameworks to ensure economic sustainability of technologies transferred. The following two technology options are being explored:

- Replacement of small fossil fuel generators in an industrial estate/provincial town with biomass-based high efficiency electricity generators of 3–5 megawatt (MW)
- Replacement of diesel oil with available biomass in existing industrial captive power generation systems based on combined heat and power cycle.

Implementation status

The project was endorsed by the GEF CEO in May 2012; its first phase is scheduled to conclude in 2012.

Observations on the project's challenges reported by the GEF Agency include: Cambodia faces a lack of competent local technology suppliers and after-sales servicers; a lack of understanding by industry executives possessing surplus biomass of the economic and environmental potential for clean and green energy; insufficient technical capacity within both enterprises and the market to identify, develop, and implement renewable energy projects and measures; and financing and credit constraints for associated private enterprises. Significant improvements in biomass power generation technologies have taken place in the Asian region, particularly in India, China, Malaysia, and Thailand. Cambodia can likely benefit from such improvements through South-South technology transfer.

CHILE—LOCAL SOLAR TECHNOLOGY DEVELOPMENT FOR HEATING AND POWER GENERATION

| | |
|--------------------------|--|
| Project Title: | Promotion and Development of Local Solar Technologies in Chile |
| GEF Agency: | Inter-American Development Bank (IDB) |
| GEF Financing: | \$3,000,000 |
| Co-financing: | \$31,750,000 total |
| Public Sector: | \$31,750,000 |
| Private Sector: | Expected: \$30,000,000 (to be confirmed) |
| Dates of Implementation: | 2012–2016 |

Project overview

Northern Chile receives one of the highest concentrations of solar radiation in the world, with great potential for solar energy generation. Yet this potential has not been fully utilized, primarily due to limited availability of suitable technologies and low levels of investment. Chile has relied on nearby countries for natural gas and oil to meet its increasing energy demand and to maintain its economic growth. Against this backdrop, the country has recently taken steps to increase the use of renewable energy in order to reduce its reliance on imported fossil fuels and to expand electricity service in rural areas.

The general objective of this project is to support the Government of Chile and its National Energy Commission in developing a solar technology industry—for both solar water heating and electric power generation. This is the first project in Chile to promote distributed generation with solar power applications installed in households, which promises to lower energy losses from transmission.

Specific objectives include:

- To promote transfer of technology, institutional strengthening, and capacity building in solar technology;
- To develop pilot projects using solar technologies for both solar water heating and power generation; and
- To support the design of incentives, financial mechanisms, and a public awareness campaign to promote solar technology projects for both solar water heating and power generation.

The project aims to enhance the capabilities of domestic solar water heater and photovoltaic (PV) panel manufacturers, and to help implement concentrating solar power projects. It supports:

- The installation of 100 m² of solar collectors with an expected further development of 397,800 m² of solar collectors for solar hot water units.
- The installation of 300 kilowatts-peak (kWp) of solar PV systems with an expected further development of 3 MW.
- The installation of up to 5 MW of concentrated solar power production with an expected further development of 30 MW.

This project has the potential to reduce 136,996 tonnes of direct carbon dioxide equivalent (CO₂ eq) emissions over the next 20 years. The estimated total indirect emissions foregone are 0.41 million tonnes (Mt) CO₂ eq over 20 years.

Implementation status

The project was endorsed by the GEF CEO in June 2012. The project is yet to be approved by the Inter-American Development Bank (IDB).

CHINA—GREEN TRUCKS FOR CLEANER AND MORE EFFICIENT FREIGHT TRANSPORT

| | |
|--------------------------|-----------------------------------|
| Project Title: | Green Truck Demonstration Project |
| GEF Agency: | World Bank |
| GEF Financing: | \$4,868,000 |
| Co-financing: | \$9,770,000 |
| Public Sector: | \$2,365,000 |
| Private Sector: | \$7,405,000 (estimated) |
| Dates of Implementation: | 2011–2015 |

Project overview

The transport sector is a major consumer of energy in China, accounting for 30 percent of total crude oil consumption. It is

also a rapidly growing source of GHG emissions: transport-based GHG emissions are expected to increase by almost 400 percent from 2004 to 2030 in China. The number of trucks on the road is expected to increase six-fold by 2035 as the demand for road freight transport is rapidly increasing. Fuel efficiency of freight transport is 30 percent lower than in advanced industrialized countries. These figures indicate that the freight transport sector has significant potential to improve fuel efficiency and reduce GHG emissions.

However, many cost-effective technologies available internationally are not yet widely utilized in China for a number of reasons. First, existing policies do little to create incentives for the development of markets for innovative technologies designed to reduce energy consumption in the existing freight transport fleet. Second, few if any efficiency improvements are made in the new truck fleet due to limited incentives for the adoption of these newer technologies. Finally, the clients of freight service providers remain unaware about the merits, cost savings, and potential for fuel efficiency improvement.

This project supports green truck demonstrations in Guangdong Province to accelerate the transfer and deployment of clean technologies in the road freight sector, thereby contributing to reducing GHG emissions and to improving air quality. Guangdong Province serves as the focus for project activities because freight transport there represents a very high share of overall fuel consumption, accounting for almost 80 percent of transport fuel use. The green truck technologies and practices for this project include: improved aerodynamics; improved tire systems; enhanced truck maintenance; driver training on fuel efficiency; and improved logistics management. More than 150 old trucks are to be retrofitted with different types of green truck technologies verified under the United States Environmental Protection Agency Smartway Program, which has showcased environmentally cleaner, more fuel-efficient transportation options. Innovative financing mechanisms are



*Installing aerodynamic technology
Photo credit: World Bank*

made available to participating carriers to enable them to purchase at least 150 new green trucks. Through licensing or intellectual property rights transfer, local technology vendors or truck producers are expected to make available an additional 1,000 new trucks. These technologies are expected to lead to an average 20 percent reduction in fuel usage in existing and new trucks.

The project will result in an estimated reduction of 9.6 Mt CO₂ eq emissions over eight years.

Implementation status

The project was launched in October 2011 with a workshop organized in conjunction with the first international Green Freight Exhibition in Guangdong, China. Over 60 policy makers, truck companies, and international experts discussed how to maximize fuel savings through the project and make maximum use of existing international experience. The selection and enrollment of eligible technologies and participating truck carriers started in March 2012. The new technologies have also been demonstrated to potential investors. Consultation workshops and applications from truck carriers already show that certain types of technologies demonstrated under the Guangzhou pilot are being adopted by early adopters among truck carriers in the Guangdong market. The project experiences were also shared and disseminated at the China Green Freight Seminar in June 2012. These logistics pilots are linked to a national green logistics demonstration program led by the Ministry of Transport to ensure proper coordination of initiatives at the national level. The project achievements are showcased in various major events inside and outside China.

COLOMBIA, KENYA, AND SWAZILAND—HARNESSING SOLAR POWER FOR VACCINES AND HOUSEHOLDS THROUGH SOLARCHILL REFRIGERATORS

| | |
|--------------------------|---|
| Project Title: | SolarChill Development, Testing, and Technology Transfer Outreach |
| GEF Agency: | UNEP |
| GEF Financing: | \$2,841,300 |
| Co-financing: | \$5,663,000 total |
| Public Sector: | \$2,528,000 |
| Private Sector: | \$1,435,000 |
| Other: | \$1,700,000 |
| Dates of Implementation: | 2013–2018 |

Project overview

SolarChill is an initiative that began in 2000 by a consortium of bi- and multi-lateral agencies, NGOs, and others that started to stimulate the development of vaccine refrigerators



SolarChill refrigerators
 Photo credit: SolarChill Partnership

that are environmentally sound, battery free, technologically reliable, affordable, and multi-source powered. SolarChill refrigerators address a number of problems posed by vaccine refrigerators fueled by kerosene and liquefied petroleum gas in terms of cost, reliability, and environmental impacts. A third generation of SolarChill refrigerators is ready for large-scale testing, presenting a unique opportunity for health ministries and clinics to benefit from the latest in solar-powered refrigeration technology.

This project aims to commercialize and transfer the SolarChill vaccine refrigerator (SolarChill A) and to begin the process of commercializing and transferring the SolarChill household and light commercial refrigerator (SolarChill B). The goal is to provide product tests of meaningful scale to allow the technology to proceed to the final stages of commercialization in two developing countries with potential for technology transfer to private-sector producers. The market potential for SolarChill A, which has recently been certified by the World Health Organization, has been estimated at between 3,000 to 5,000 units annually. The demand for household and light commercial refrigerators is more significant for populations not living near the electrical grid, and may be considered as a more profitable product for companies considering the technology for production.

The project will consist of four activities. First, it will procure and distribute 200 SolarChill A refrigerator models in each country that will be placed in clinics and monitored to generate data verifying the refrigerators' reliability. The SolarChill A will then be subjected to rigorous testing

based on certification standards required for World Health Organization Performance, Quality and Safety vaccine refrigerators. The reliability data generated will be critical to supporting awareness campaigns and to enabling governments and donors to start using the refrigerators. Second, the project will procure 15 SolarChill B models for each partner country to be demonstrated in industry shows and to be placed in businesses and other places for reliability modeling and marketing. Third, marketing and awareness-raising campaigns will be conducted to increase familiarity with the refrigerators, to stimulate market demand, and to pave the way for accelerated commercialization, production, and technology transfer. Finally, support will be provided to governments of countries with refrigerator production capacity to develop and implement their hydrochlorofluorocarbon (HCFC) Phase-Out Management Plan (Swaziland and Colombia) by promoting the countries' ability to undertake SolarChill production as an additional benefit of converting from fluorocarbons to hydrocarbons for use as refrigerants.

Implementation status

This project was initially approved in response to the Poznan Strategic Program on Technology Transfer with the World Bank as the Implementing Agency. However, the World Bank withdrew in 2010 from the project. The project was then re-submitted by UNEP with the addition of Swaziland. The GEF Council approved the project in November 2011. The request for endorsement by the GEF CEO is expected to be submitted by May 2013.

COTE D'IVOIRE—REDUCING GHG EMISSIONS WITH INTEGRATED MUNICIPAL WASTE MANAGEMENT

| | |
|---------------------------------|---|
| Project Title: | Construction of 1,000 Ton per Day Municipal Solid Waste Composting Unit in Akouédo Abidjan |
| GEF Agency: | African Development Bank (AfDB) |
| GEF Financing: | \$3,000,000 |
| Co-financing: | \$36,898,500 total |
| Public Sector: | \$1,888,500 |
| Private Sector: | \$35,010,000 |
| Dates of Implementation: | 2013–2016 |

Project overview

Akouédo is the only landfill for the urban agglomeration of Abidjan. Since 1965, solid wastes have been dumped here without any treatment or environmental safeguards. Once the wastes get to the site, they are simply spread mechanically with a stampede of informal sorters. This uncontrolled open site poses serious health concerns to the nearby population. Five million m³ of contaminated

water from the site presents risks to the water table and the nearby lagoon. Biodegradable wastes are also a source of GHG emissions.

The objective of this project is to transfer technologies for sustainable integrated management of the municipal solid wastes by the construction of a municipal solid waste treatment plant, including an industrial composting unit, thus reducing local pollution and contributing to GHG emission reduction and the fight against climate change. The project is expected to help the country develop its capacity in waste treatment and build consensus on climate change mitigation technologies. Industrial treatment of municipal solid wastes could help address concerns of GHG emissions through composting, and recovery of recyclable materials could create job opportunities. The project should also enable farmers to improve soils and crop productivity with compost and reduce use of chemical fertilizers. The main expected outputs include the following:

- Diagnosis of the current waste management system to serve as a basis for the formulation and adoption of integrated waste management and awareness raising plan;
- Establishment of a sustainable waste collection system and the capacity reinforcement of all actors involved in waste collection system; and
- Installation of a 3,000 tonnes/day municipal solid waste treatment plant including a 1,000 tonnes/day industrial composting unit, a waste fermentation storage pit, a leachate treatment unit and a sanitary filling zone.

The project is based on South-South industrial cooperation with China to introduce municipal solid waste treatment and composting technology systems designed and applied in China with proven efficiency for decades. The proposed integrated and sustainable waste management is a first of its kind in Cote d'Ivoire and in West Africa, and will serve as a basis for replication in the country and in the region.

Implementation status

The preparation of the project is in its final stage. The project preparation faced significant challenges, as it coincided with a period of instability in the country, with changes in the political environment as well as in government priorities. Given the national situation, milestone extension requests were approved by the GEF CEO in September 2011 and in June 2012. The Implementing Agency has pledged to submit the CEO endorsement request by the end of 2012.

Lessons learned during the preparation of this project provided insights on leveraging private financing. For this project, as with others, while the proposed investments

may be assessed as economically and financially attractive, potential investors still need sufficient facts and information to make a final investment decision. The preparation phase is therefore an important step in establishing adequate documentation to appeal to financiers.

JORDAN—WATER AND ENERGY EFFICIENT IRRIGATION THAT ACCOMMODATES SALINE WATER

| | |
|---------------------------------|---|
| Project Title: | dHRS Irrigation Technology Pilot Project to Face Climate Change Impacts |
| GEF Agency: | International Fund for Agricultural Development (IFAD) |
| GEF Financing: | \$2,365,000 |
| Co-financing: | \$5,516,000 total |
| Public Sector: | \$4,100,000 |
| Private Sector: | \$1,416,000 |
| Dates of Implementation: | 2012–2016 |

Project overview

Jordan is one of the world's most water-scarce countries. Water scarcity is a leading constraint in the agriculture sector, which is the main consumer of water. The climate in the region is predicted to become hotter and drier, in turn increasing the incidence of drought (IPCC 2007). The ability of Jordan's agriculture sector to adapt to increased water scarcity will be crucial for the country's human development and growth.

The objective of this project is to reduce vulnerability to climate change in Jordan's agriculture sector, particularly in the area of water resources management, by piloting efficient water-use technologies. The project focuses on promoting a pro-poor and community-based approach to technology transfer by directly engaging farmers and local stakeholders in the installation, use, and maintenance of new technologies.



Water and energy efficient irrigation trial applications
Photo credit: duPont



*Water and energy efficient irrigation in applications from Abu Dhabi (2009)
Photo credit: dti-r*

Climate change adaptation measures in the agriculture sector, including conservation agriculture, improved water-use efficiency, and water harvesting techniques, have been identified in Jordan's Second National Communication to the UNFCCC. The government has shown strong commitment to this project, providing co-financing through the National Centre for Agricultural Research and Extension.

Implementation status

The project was endorsed by the GEF CEO in May 2011 and has since begun implementation.

MEXICO—DEVELOPING A VALUE CHAIN FOR DOMESTIC WIND TURBINE PRODUCTION

| | |
|--------------------------|--|
| Project Title: | Promotion and Development of Local Wind Technologies in Mexico |
| GEF Agency: | IDB |
| GEF Financing: | \$5,500,000 |
| Co-financing: | \$33,660,000 total |
| Public Sector: | \$29,660,000 |
| Private Sector: | \$4,000,000 |
| Dates of Implementation: | 2012–2015 |

Project overview

Mexico is an oil-exporting country rich in fossil fuel resources. However, its future national energy demands may not be met with fossil fuel-based energy sources due to scarcity of investment resources and other factors. The expected rise of natural gas imports, the volatility of fossil fuel prices, as well as climate change concerns have prompted growing interest by the Mexican government to develop domestic sources of renewable energy to complement fossil fuels in power production and supply.

There are many areas in the country with moderate to very favorable wind resources that could be tapped for wind

energy generation. Mexico's strongest wind energy resource is found in a 3,000 km² region known as La Ventosa, located in the State of Oaxaca. Initial data from an ongoing pilot plant in this region indicate that the average capacity factor for wind power plants in the region could exceed 30 percent, higher than average capacity factors of the majority of wind resource areas around the world.

In order to tap this potential for wind energy, Mexico seeks to promote a local manufacturing base for wind turbines. This will address the needs of smaller developments, such as one or two wind turbines for distributed generation, and also address the limited availability of turbines on the international market for strong wind regions such as La Ventosa. Mexico already possesses most of the capacity required for turbine manufacturing, albeit with varying degrees of competitiveness.

This project supports Mexico's drive to become a key player in the global wind energy market, expanding its wind generation capacity by facilitating local development and implementation of wind power installations. The project provides support to develop a value chain for the domestic production of wind turbines adapted to local conditions. The project has the following activity components:

- Design and specification of wind turbine components, including blueprints for manufacturing and assembly of wind turbine components, and operational manuals for installation, operation and maintenance;
- Procurement, manufacturing and assembly of wind turbine components for a Class 1A wind turbine prototype suitable for Mexican conditions and verification of the blueprint parameters;
- Erection, start-up and operational testing of the wind turbine; and
- Capacity building and institutional strengthening to promote a wind power market for distributed generation by small power producers.

This project has the potential to directly reduce 47,903 tonnes of CO₂ eq emissions over the next 20 years. The estimated total indirect emissions avoided are 3.74 Mt over 20 years.

Implementation status

The project was approved by the IDB in May 2012, following endorsement by the GEF CEO in December 2011. The project is now under implementation.

RUSSIAN FEDERATION—ENERGY EFFICIENCY IMPROVEMENT AND PHASE-OUT OF OZONE DEPLETING SUBSTANCES IN REFRIGERATION AND AIR CONDITIONING

Project Title: Phase out of HCFCs and Promotion of HFC-Free Energy Efficient Refrigeration and Air-Conditioning Systems in the Russian Federation through Technology Transfer

GEF Agency: UNIDO

GEF Financing: \$19,998,000

Co-financing: \$40,000,000 total

Public Sector: \$2,500,000

Private Sector: \$37,500,000

Dates of Implementation: 2010–2015

Project overview

Under article 2 of the Montreal Protocol, the Russian Federation is reducing consumption and production of HCFCs by 75 percent relative to its baseline consumption of 3,996.9 ozone depleting potential (ODP) tonnes by 2010. A further reduction of 90 percent relative to the baseline is required by 2015. At present, there are three main barriers to achieving the phase-out and delivering long-term solutions to enhance use of alternative technologies in the foam and refrigeration and air conditioning sectors. They are: insufficient institutional capacity, lack of suitable alternative technologies, and insufficient market drivers for environmentally friendly equipment and products. This project represents the first comprehensive international effort to address the full scope of work for HCFC phase-out and to fully integrate related environmental issues.

The primary objective of this project is the direct phase out of 600 ODP tonnes of HCFCs in the foam and refrigeration manufacturing sectors in the Russian Federation to help meet the 2015 Montreal Protocol target. The secondary objective of the project is to introduce more energy efficient designs and practices, through technology transfer, during the conversion of refrigeration and air conditioning manufacturing facilities.

The principal technology transfer activity is the provision of thermodynamic and engineering design as well as a code of practice for the service of high-efficiency non-HCFC and HFC-free refrigeration equipment and air conditioners. The technology transfer component aims at stimulating the market to adopt refrigerants with low global warming potential (GWP) in energy-efficient refrigeration and air conditioning equipment. In the course of replacing HCFCs with ODP-free and low-GWP alternatives, equipment designs will be analyzed and improved to reduce energy consumption by approximately 25 to 30 percent.

The project includes the creation of a Center of Excellence to stimulate the rollout and replication of new technologies—by providing ongoing support for design and service activities and by encouraging the adoption of energy-efficient technologies through financial incentives. This, in turn, will increase the new technologies' dissemination to a broader range of consumers and users of refrigeration and air conditioning systems.

The direct GHG emissions reduction resulting from the phase-out of HCFCs will be approximately 15.6 Mt CO₂ eq. The indirect GHG emissions reduction through reduced electricity consumption in the commercial and industrial refrigeration sectors is approximately 10 Mt CO₂ eq over five years.

Implementation status

Project inception occurred in March 2011. The national project team was established and a detailed work plan developed. The procurement of production equipment for the investment component, especially in the foam sector, has been partially completed.

The project contributed to the organization of the Microclimate, Energy Efficiency and Building Automation Center, which will support dissemination of environmentally-friendly and energy-efficient heating, ventilation, air-conditioning and refrigeration (HVAC&R) systems within the framework of the public education system of the Russian Federation. The Center joins prominent players in the Russian HVAC&R market and such organizations as the Russian Energy Agency, the Ministry of Energy, and the Nonprofit Partnership "Green Standards Environmental Certification Center." The project also organized a Campaign for the Promotion of HCFC Phase-Out in the Russian Federation, while institutional strengthening, training of technicians, and customs officers are ongoing.

SENEGAL—BUILDING AND INSULATING WITH TYPHA TO ADDRESS ENERGY EFFICIENCY, CLIMATE CHANGE, AND BIODIVERSITY CONCERNS

Project Title: Technology Transfer: Typha-Based Thermal Insulation Material Production in Senegal

GEF Agency: UNIDO

GEF Financing: \$2,310,000

Co-financing: \$3,973,000 total

Public Sector: \$2,200,000

Private Sector: \$1,420,000

Others: \$353,000

Dates of Implementation: 2012–2016

Project overview

Bulrush, or typha australis, is an invasive species causing serious problems in Senegal's ecosystem and economy. The proliferation of this plant in the Senegal River is in part due to ecosystem changes from an upstream hydro-power dam and a salt-wedge dam built in the 1980s. Today, typha has invaded approximately 140,000 hectares, spreading at 10 percent per year, with negative health and livelihood impacts.

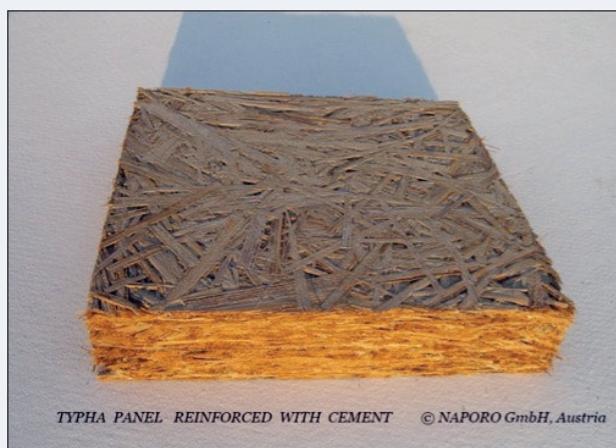
In parallel, the country has faced weakened industrial and economic development due to power production shortfalls and poor quality of electricity supply. In order to reduce energy consumption in the building sector, Senegal is in need of effective, thermally efficient and affordable building materials. While cement is domestically produced, suitable aggregates and complementary materials are rather limited. Buildings are also rarely insulated, due to lack of availability of insulation materials. This results in suboptimal standards of comfort and energy efficiency of concrete buildings. There is a critical need to supply appropriate thermal insulation materials to the building sector. Typha can be harvested and used as a raw material for insulation to reduce energy consumption of both new construction and retrofitting of existing buildings to reduce electricity consumption and related GHG emissions.

The objective of this project is to facilitate the transfer of technology for producing innovative thermal insulation materials using typha. The project is interdisciplinary with positive effects on energy efficiency, climate change, and biodiversity.

The combination of typha and cement offers a wide range of promising construction products, ranging from additive and formwork to strong panels, columns and beams. The use of typha as insulation materials has been validated in European-based research institutions. This collaborative project aims to refine the technology in order to transfer it to Senegal.

In particular, the project includes: research and development; certification and patenting; establishing a local production chain through investment in a production facility for the innovative insulation materials; and adapting insulation materials to local conditions. Demonstration and project monitoring will be conducted on a government building retrofitted with typha-based insulation.

As a result of project implementation, direct GHG emissions reductions of about 556 tonnes of CO₂ eq are expected. The range of indirect CO₂ eq emissions reductions is estimated at 1,700–40,100 tonnes of CO₂ eq.



Typha vegetation and construction material made with typha
Photo credit: UNDP, Naporo GmbH cited by UNDP

Implementation status

The project was endorsed by the GEF CEO in August 2012 and has started implementation.

This project illustrates the merits of project preparation, stakeholder engagement, and raising awareness. The project preparation phase generated significant interest from stakeholders in both the private and the public sectors. National institutions (Ministry of Environment, Ministry of Energy, Energy Efficiency Agency, Ministry of Education and Professional Training, and others) began discussing the best way to work together to promote an energy-efficient building sector. The project is also raising the interest of neighboring countries, and of regional institutions such as the Economic Commission for West African States. Such stakeholder engagement and dialogue during the project preparation phase generated insight into the importance of a favorable policy environment for technology transfer.

SRI LANKA—IMPROVING ENERGY ACCESS AND HALTING LAND DEGRADATION WITH BAMBOO

| | |
|--------------------------|---------------------------------|
| Project Title: | Bamboo Processing for Sri Lanka |
| GEF Agency: | UNIDO |
| GEF Financing: | \$2,700,000 |
| Co-financing: | \$21,297,000 total |
| Public Sector: | \$18,897,000 |
| Private Sector: | \$2,400,000 |
| Dates of Implementation: | 2012–2019 |

Project overview

Sri Lanka faces degradation of forest resources due to increased demand for timber and fuel wood from population pressure and economic growth. A sizeable part of the agricultural lands in different parts of the country, including at least 30 percent of the tea land, has also become marginal or uneconomic. Many areas are in urgent need of land cover to prevent further degradation. Bamboo cultivation on the degraded lands offers an ideal alternative to halt land degradation and provide sustainable energy source. To support this on a long-term basis, there is a need to create an industry whose continued existence (and profitability) depends on a sustainable feedstock resource. Experiences in other Asian countries, such as China and India, have shown that a bamboo industry can be a sustainable industry. While bamboo is already a key product of forestry and agriculture on a world scale, only a limited area of bamboo plantation exists in Sri Lanka, mainly used locally for fuel and in low quality construction.

This project has the objective to develop a bamboo supply chain and product industry in Sri Lanka, leading to reduced global environmental impact from GHG emissions and a sustainable industry base. The project seeks to develop new bamboo plantations covering 10,000 hectares on degraded land to serve as an industry cluster. The industry would have engineered bamboo materials for structural applications, bamboo pellets for local energy use and for export markets, and bamboo sprouts for food. As Sri Lanka already has a wood processing industry, focusing the industry on processed and engineered bamboo products could increase the quality and value of bamboo production in the country, which in turn could increase the value added and the profitability of the industry sector.

This project involves the South-South transfer of technologies in key steps in the bamboo processing chain. For instance, the technology for bamboo tissue reproduction could be transferred from India, while the technology for bamboo processing could be transferred from India and possibly China. Bamboo pelletizing technology can be transferred and also utilized for other residues, such as those from rubber wood plantations.

The project also features capacity building, demonstration, and financing. It supports the development of a policy framework that promotes dedicated or mixed bamboo plantations while helping develop a market for the products.

A successful project can validate profit potential and promote continued operation and replication beyond the project time horizon. The availability of degraded land is sufficient to allow a hundred-fold replication.

In total, the incremental direct emissions reductions from the project are expected to be 182,300 tonnes CO₂ eq per year, with renewable energy generated equivalent to 311,800 MWh per year.

Implementation status

The project was endorsed by the GEF CEO in April 2012. Its inaugural workshop took place in September 2012.

THAILAND—ETHANOL PRODUCTION FROM CASSAVA

| | |
|--------------------------|---|
| Project Title: | Overcoming Policy, Market and Technological Barriers to Support Technological Innovation and South-South Technology Transfer: the Pilot Case of Ethanol Production from Cassava |
| GEF Agency: | UNIDO |
| GEF Financing: | \$2,970,000 |
| Co-financing: | \$31,623,000 total |
| Public Sector: | \$6,623,000 |
| Private Sector: | \$25,000,000 |
| Dates of Implementation: | 2011–2015 |

Project overview

Thailand has set a high target for renewable energy sources in its National Renewable Energy Master Plan. Of the 20 percent target for the renewable portion of total projected energy demand by 2022, 4 percent will be contributed by biofuels such as ethanol and biodiesel. For ethanol, the target is to increase its consumption in transportation by mandating a phase-out program for regular fuels and an introduction of gasohol. The country has sufficient raw materials, especially molasses and cassava, to produce ethanol. Contract farming in neighboring countries has been encouraged to ensure raw material supply and to create wider commercial opportunities and technology transfer opportunities to farmers.

The project aims at removing barriers and promoting technology transfer in the production of ethanol and at enhancing South-South cooperation. The targeted technology is



simultaneous saccharification and fermentation, which includes improved culturing techniques, raw material preparation, fermentation technology and shortcuts to the fermentation processes, and options for net energy reduction throughout the project cycle.

The project also aims to increase fermentation efficiency in ethanol production, to promote private sector engagement, and to transfer the associated technologies to other countries in Southeast Asia. The project includes technology demonstrations to enhance and motivate full-scale technology investments (e.g., it offers to establish a demonstration plant in collaboration with an interested partner). In order to remove policy and financial barriers, the project also provides training to policy makers, banks, and entrepreneurs. The technology will be transferred to Vietnam, reflecting lessons

learned from demonstration in Thailand. The project also supports activities in Myanmar and Lao PDR to lay the foundation for technology transfer. In addition, the project responds to findings from TNAs in both Thailand and Vietnam.

Implementation status

The project was endorsed by the GEF CEO in March 2012. The project is waiting for the Royal Thai Government to give the green light for the official start-up. During the third quarter of 2013, the project plans to launch a demonstration unit in Thailand. The project also intends to organize an investment forum back-to-back with this launch. The implementing Agency expects that the event will receive a high level of interest from both the public and the private sectors.

TABLE 1 TECHNOLOGY TRANSFER PILOT PROJECTS SUPPORTED BY THE POZNAN STRATEGIC PROGRAM ON TECHNOLOGY TRANSFER AS OF SEPTEMBER 2012

| COUNTRY | PROJECT TITLE | GEF AGENCY | GEF POZNAN PROGRAM FUNDING (\$) ^a | TOTAL GEF FUNDING (\$) ^a | CO-FINANCING (\$) ^b | STATUS OF PROJECT |
|----------------------------|--|------------|--|-------------------------------------|--------------------------------|--|
| Brazil | Renewable CO ₂ Capture and Storage from Sugar Fermentation Industry in Sao Paulo State | UNDP | 2,970,000 | 2,970,000 | 7,715,000 ^b | The project was cancelled in February 2012 upon request from the Agency. The project preparation identified investment costs far higher than initially expected, exceeding the available financing. |
| Cambodia | Climate Change Related Technology Transfer for Cambodia: Using Agricultural Residue Biomass for Sustainable Energy Solutions | UNIDO | 1,947,000 | 1,947,000 | 4,565,000 ^c | The project was endorsed by the GEF CEO in May 2012. Project implementation is at initiation phase. |
| Chile | Promotion and Development of Local Solar Technologies in Chile | IDB | 3,000,000 | 3,000,000 | 31,750,000 ^c | The project was endorsed by the GEF CEO in June 2012 and is awaiting IDB's approval |
| China | Green Truck Demonstration Project | WB | 2,998,000 | 4,867,500 | 9,770,000 ^c | The project was endorsed by the GEF CEO in March 2011 and approved by the World Bank Board in April 2011. Project Launch took place in China in October 2011. The project is under implementation. |
| Colombia, Kenya, Swaziland | SolarChill: Commercialization and Transfer | UNEP | 2,841,300 | 2,841,300 | 5,662,900 ^b | The project was re-submitted by UNEP after the World Bank requested its cancellation in December 2010. The GEF Council approved the project in November 2011. The project has expanded to include Swaziland, in addition to Colombia and Kenya. The GEF CEO endorsement request is expected to be submitted by May 2013. |
| Cote d'Ivoire | Construction of 1000 Ton-per-day Municipal Solid Waste Composting Unit in Akouedo Abidjan | AfDB | 3,000,000 | 3,000,000 | 36,898,500 ^b | The project preparation exercise is in its final stage. Milestone extension requests were approved by the GEF CEO in September 2011 and June 2012. The GEF CEO endorsement request is to be submitted by the end of 2012. |
| Jamaica | Introduction of Renewable Wave Energy Technologies for the Generation of Electric Power in Small Coastal Communities | UNDP | 816,000 | 816,000 | 1,420,000 ^b | The project was cancelled in October 2011 upon request from the Agency. |
| Jordan | DHRS Irrigation Technology Pilot Project to Face Climate Change Impact | IFAD | 2,365,020 | 2,365,020 | 5,516,000 ^c | The project was endorsed by the GEF CEO in August 2011, and has since begun implementation. |

| COUNTRY | PROJECT TITLE | GEF AGENCY | GEF POZNAN PROGRAM FUNDING (\$) ^a | TOTAL GEF FUNDING (\$) ^a | CO-FINANCING (\$) ^c | STATUS OF PROJECT |
|----------------------|---|------------|--|-------------------------------------|--------------------------------|--|
| Mexico | Promotion and Development of Local Wind Technologies in Mexico | IDB | 3,000,000 | 5,500,000 | 33,660,000 ^c | Project was endorsed by the GEF CEO in December 2011. Project implementation is expected to commence during the third quarter of 2012. |
| Russian Federation | Phase-out of HCFCs and Promotion of HFC-free Energy Efficient Refrigeration and Air-Conditioning Systems in the Russian Federation through Technology Transfer | UNIDO | 2,970,000 | 19,998,000 | 40,000,000 ^c | The project was endorsed by the GEF CEO in August 2010. Project implementation has started. |
| Senegal | Typha-based Thermal Insulation Material Production in Senegal | UNDP | 2,310,000 | 2,310,000 | 3,972,574 ^b | The project was endorsed by the GEF CEO in August 2012 and has started implementation. |
| Sri Lanka | Bamboo Processing for Sri Lanka | UNIDO | 2,700,500 | 2,700,500 | 21,297,000 ^c | The project was endorsed by the GEF CEO in April 2012. The project is under implementation. |
| Thailand | Overcoming Policy, Market and Technological Barriers to Support Technological Innovation and South-South Technology Transfer: The Pilot Case of Ethanol Production from Cassava | UNIDO | 2,970,000 | 2,970,000 | 31,623,000 ^c | The project was endorsed by the GEF CEO in March 2012. It is awaiting approval by the Royal Thai government. |
| Turkey, Cook Islands | Realizing Hydrogen Energy Installations on Small Island through Technology Cooperation | UNIDO | 3,000,000 | 3,000,000 | 3,500,000 ^b | The project was cancelled in March 2012 upon request from the Agency following changes in the concerned governments' priorities. |
| TOTAL | | | 36,071,820 | 57,469,320 | 180,804,500 | |

a Includes Agency fees and project preparation grants.

b co-financing amount at the GEF Council Approval.

c co-financing amount at the GEF CEO Endorsement.

Technology Transfer Pilot Projects within the Long-Term Program

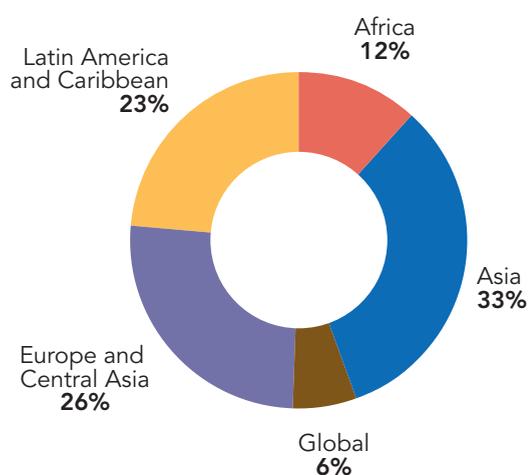
In implementing the Long-Term Program on Technology Transfer, the GEF has expanded its piloting of technology projects to foster innovation and investments.

During the first two years of GEF-5 (Fiscal Year (FY) 2011 and FY 2012), the GEF has approved 85 climate change mitigation projects with \$835.6 million of GEF funding and \$5.9 billion of co-financing. Among these projects, 19 projects address the promotion and transfer of innovative low-carbon technologies, while the remaining 66 are aimed at market transformation for specific technologies. Four of these projects incorporate both mitigation and adaptation objectives (with additional funding from the SCCF), while 37 combine climate change mitigation objectives with the objectives of other focal areas.

The GEF, through its management of the LDCF and SCCF, has also approved \$168 million and \$71.8 million, respectively, for 40 and 19 projects with a specific focus on the transfer of adaptation technologies, including the four projects incorporating both mitigation and adaptation objectives mentioned above. These projects represent a considerable contribution towards the demonstration, deployment, and diffusion of climate-resilient technologies. In addition, most adaptation projects under the LDCF and the SCCF promote the transfer of adaptation technologies in a cross-cutting manner.

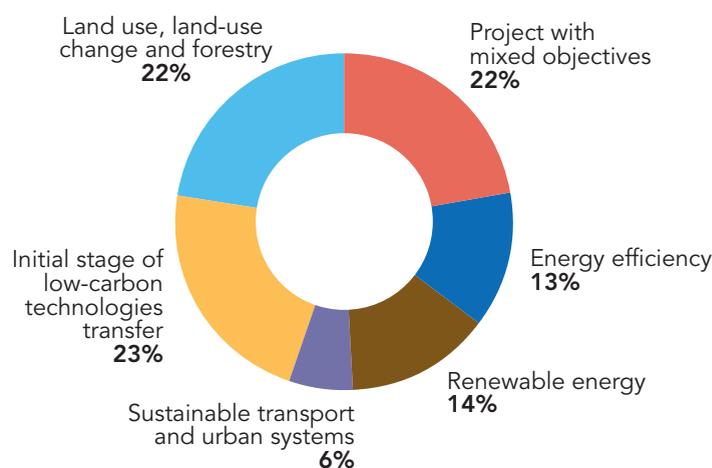
The distribution of mitigation projects by region is shown in Figure 4.

FIGURE 4 REGIONAL DISTRIBUTION OF THE NUMBER OF GEF MITIGATION PROJECTS CONTRIBUTING TO THE LONG-TERM PROGRAM ON TECHNOLOGY TRANSFER (AS OF JUNE 2012)



The number of mitigation projects within the Long-Term Program is balanced among the different stages of innovation supported: one-fourth of the projects include a component aimed at the initial stages of innovative low-carbon technologies transfer (e.g. demonstration and deployment), while the rest target market transformation (targeting larger scale diffusion) for specific technologies. The variety of technologies targeted is diverse; one-fifth of all mitigation projects promote market transformation for several technologies at the same time (classified as "mixed").

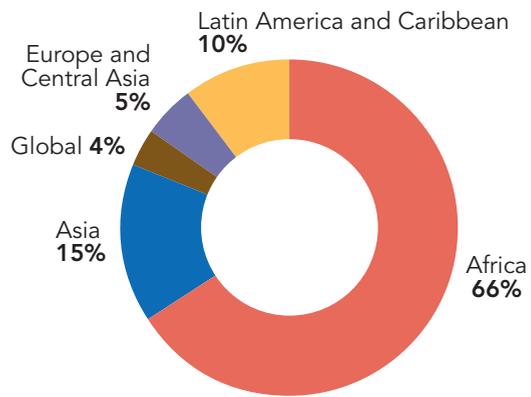
FIGURE 5 DISTRIBUTION OF THE NUMBER OF GEF MITIGATION PROJECTS BY OBJECTIVE—LONG-TERM PROGRAM ON TECHNOLOGY TRANSFER (AS OF JUNE 2012)



Projects that have a component aiming at the initial stage of technology transfer (promotion and demonstration) are classified as "low-carbon technology transfer." All other categories aim at market transformation for specific technologies. For these, projects are accounted if their objective is solely focused on one considered category. Market transformation projects with multiple mitigation objectives are classified as "mixed."

The regional distribution of adaptation projects within the Long-Term Program shows that most of these projects (and funding) are located in the African region, where adaptation is a top priority.

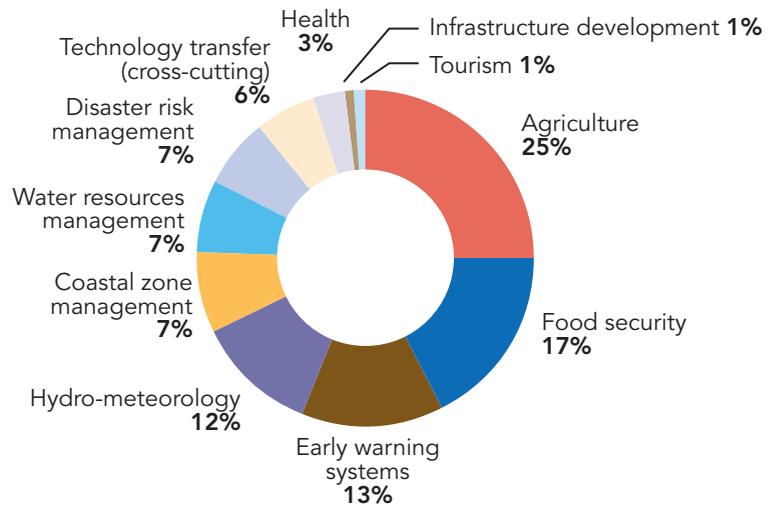
FIGURE 6 REGIONAL DISTRIBUTION OF THE NUMBER OF GEF ADAPTATION PROJECTS CONTRIBUTING TO THE LONG-TERM PROGRAM ON TECHNOLOGY TRANSFER (AS OF JUNE 2012)

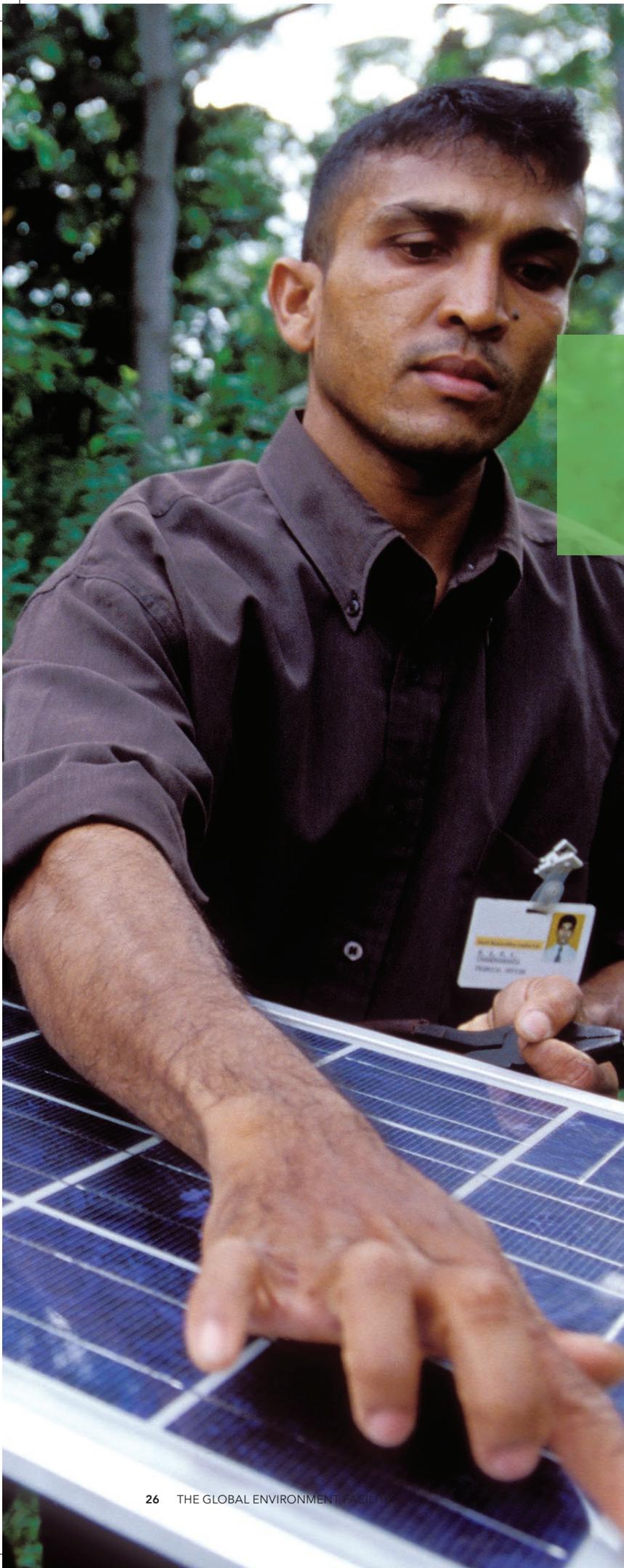


Adaptation projects contributing to the Long-Term Program usually involve multiple adaptation technologies at the same time. The exceptions are coastal zone management and water resources management projects, where the focus tends to be on specific technologies in a single sector.

Adaptation projects within the Long-Term Program encompass a wide range of technologies. A significant number of projects (42 percent) include a component on agricultural technologies or technologies related to food security. Projects dealing with early warning systems and hydro-meteorological monitoring also make up another large area (25 percent) of technology transfer for adaptation.

FIGURE 7 DISTRIBUTION OF THE NUMBER OF GEF ADAPTATION PROJECTS BY OBJECTIVE—LONG-TERM PROGRAM ON TECHNOLOGY TRANSFER (AS OF JUNE 2012)





Supporting Climate Technology Centers and Networks

The Long-Term Program on Technology Transfer submitted to COP 16 includes two elements that are additional to the original Poznan Strategic Program. The first new element is the support for Climate Technology Centers and a Climate Technology Network. The aim of this element of the Long-Term Program objective is to support coordination of climate technology transfer at the global level while also supporting regional technology centers. Countries wishing to establish a national center and network have also been invited to do so by utilizing existing GEF national allocations.

In line with the Long-Term Program, the GEF Council in May 2011 approved the “Pilot Asia-Pacific Climate Technology Network and Finance Center” project by the ADB and UNEP. Furthermore, the GEF Council in June 2012 approved three similar regional projects: the “Climate Technology Transfer Mechanisms and Networks in Latin America and the Caribbean” project by the IDB; the “Pilot African Climate Technology Finance Center and Network” project by the AfDB; and the “Regional Climate Technology Transfer Center” project by the European Bank for Reconstruction and Development (EBRD).

All four projects receive funding from the GEF Trust Fund for mitigation, as well as from the SCCF for adaptation, benefiting from a key GEF-5 reform enabling the GEF to finance multi-trust fund projects that address at once adaptation to climate change and mitigation. They are expected to generate lessons learned to help inform the ongoing process to operationalize the Technology Mechanism, in particular the Climate Technology Center and Network (CTCN) of the UNFCCC.

TABLE 2 GEF REGIONAL PROJECTS FOR CLIMATE TECHNOLOGY FINANCE CENTRES AND CLIMATE TECHNOLOGY NETWORKS

| TITLE | REGION | AGENCY | GEF FINANCING (\$ MILLIONS) | | CO-FINANCING (\$ MILLIONS) |
|--|---------------------------------------|-----------|-----------------------------|------|----------------------------|
| | | | GEF TRUST FUND | SCCF | |
| Pilot Asia-Pacific Climate Technology Network and Finance Center | Asia and Pacific (AP) | ADB/ UNEP | 10.0 | 2.0 | 74.7 |
| Pilot African Climate Technology Finance Center and Network | Africa (AFR) | AfDB | 10.0 | 5.8 | 95.0 |
| Regional Climate Technology Transfer Center | Europe and Central Asia (ECA) | EBRD | 10.0 | 2.0 | 77.0 |
| Climate Technology Transfer Mechanisms and Networks in Latin America and the Caribbean | Latin America and the Caribbean (LAC) | IDB | 10.0 | 2.0 | 63.4 |

PILOT ASIA-PACIFIC CLIMATE TECHNOLOGY NETWORK AND FINANCE CENTER (ADB/UNEP)

This multi-trust fund project seeks to accelerate climate technology investments in developing countries of the Asia-Pacific region. The project aims to provide capacity building to create the necessary conditions to foster investments in climate technology transfer and mobilize appropriate financial resources from both public and private sources to catalyze investments in EST deployment. The project pilots a regional approach to facilitating deployment of climate technologies, one that combines upstream and downstream support, from networking, capacity building and technical advice so as to establish enabling conditions, down to mobilization of financial resources to make investments happen. In short, it seeks to demonstrate the effectiveness of linking technology and finance mechanisms in catalyzing climate actions. The project is under implementation.

PILOT AFRICAN CLIMATE TECHNOLOGY FINANCE CENTER AND NETWORK (AFDB)

This multi-trust fund project aims at supporting on the ground the deployment of technologies for both climate change mitigation and adaptation in developing countries in Africa. To do so, the project seeks to catalyze public and private finance for low-carbon technologies

and climate-resilient development projects, and assist with integrating technology transfer considerations into developing countries’ policies and investment programs and strengthening design and enforcement capacities of public institutions. The components financed under the SCCF-B contribute towards addressing knowledge gaps, forging partnerships, developing enabling environments, and catalyzing resources for the demonstration, deployment and diffusion of relevant technologies for climate change adaptation and climate-resilient development.

REGIONAL CLIMATE TECHNOLOGY TRANSFER CENTER (EBRD)

This multi-trust fund project proposes to set up the climate technology network and center for EBRD’s countries of operations. Its aim is to facilitate accelerated investments in climate technologies (mitigation and adaptation). It focuses on increasing private sector involvement in adopting climate technologies, showcases broader networking in the region, furthers the development of innovative financing mechanisms for both climate change mitigation and adaptation technologies, and provides a platform for disseminating knowledge and bringing together key stakeholders. The components financed under the SCCF-B leverage resources and pilot financing products for the transfer of adaptation technologies.

CLIMATE TECHNOLOGY TRANSFER MECHANISMS AND NETWORKS IN LATIN AMERICA AND THE CARIBBEAN (IDB)

This multi-trust fund project proposes to set up the climate technology network and center for Latin America and the Caribbean. Its aim is to promote the development and transfer of ESTs in the region in order to contribute to the ultimate goal of reducing GHG emissions and reducing the vulnerability to climate change in specific sectors. The project strategy is to build national capacities to identify, assess, develop and transfer ESTs, focusing on:

- Promotion of and support to regional collaborative efforts;
- Support to planning and policy-making processes at national and sectoral levels;
- Demonstration of policies and enabling mechanisms; and
- Mobilization of private and public financial and human resources.

The components financed under the SCCF-B support networking, policy support, and demonstration activities for the transfer of adaptation technologies, particularly in the agriculture sector.

At the national level, the GEF Council in June 2012 also approved the “Facility for Low Carbon Technology Deployment” project in India by the World Bank, which supports national level networking efforts and could be aligned with the CTCN of the UNFCCC, with the potential to connect with other climate technology centers in developing countries. The project will facilitate identification and deployment of low-carbon technologies in India that can address technology gaps to mitigate climate change and improve the economy’s energy efficiency. The project will do so through a Facility for Low Carbon Technology Deployment that will bring together government, industry, consumers, academia, and Civil Society Organizations representatives. Four key technology areas are identified to begin operations: refrigeration; air conditioning; lighting; and low-temperature waste-heat recovery. The facility will be designed to be sustainable over the long-term using private sector support.

Beyond these piloting and innovative examples, the GEF, with the means at its disposal and in line with GEF procedures, is ready to continue to support the operationalization and activities of the CTCN in response to decision 2/CP.17.





Supporting Public-Private Partnerships for Technology Transfer

PPPs support to facilitate technology transfer was introduced with the Long-Term Implementation Program. The PPPs are viewed as a powerful tool for promoting technology transfer by supporting businesses in finding ways to commercialize or scale up environmentally sound technologies. To be able to do so, within GEF-5, the Parties to the GEF replenishment agreed to a private sector set-aside of \$80 million.

At the November 2011 Council meeting, the GEF-5 Revised Strategy for Enhancing Engagement with the Private Sector (GEF 2011b), defining specific modalities for utilizing the set-aside, was approved. The strategy emphasizes partnerships with the multilateral development banks to focus on the expanded use of non-grant instruments, and also includes components to support technology transfer and innovation among small and medium enterprises (SMEs). To guide the implementation of PPP Programs (GEF 2012d) under the approved strategy, the *Operational Modalities for Public Private Partnership Programs* was developed and submitted to the GEF Council in June 2012. These operational modalities describe the process for preparing and submitting PPP Programs as Programmatic Framework Documents under the GEF Process Cycle.

Under the approved strategy, the GEF has worked with multilateral development banks to develop PPP Programs that will make investments in private sector partners for activities that will generate Global Environmental Benefits. The GEF Council in June 2012 approved two regional PPP

Programs as the first to access the GEF-5 private sector set-aside:

- AfDB PPP Program.
- Multilateral Investment Fund (MIF)-IDB PPP Program;

These two PPP programs described below will deliver significant Global Environmental Benefits, including reduction of GHG emissions, and enhance private sector engagement in Latin America and Africa. They aim to use concessional loans or equity investments to promote technology transfer, foster clean energy development, and protect natural resources.

AFDB-PPP PUBLIC-PRIVATE PARTNERSHIP PROGRAM

This programmatic initiative will promote scaling up of renewable energy technologies on the African continent and contribute to the delivery of universal power supply in the region. Through the support for renewable energy projects, the program will contribute to reducing GHG emissions from the energy supply. A pipeline of renewable energy investments in West, Central, and East Africa has been identified. Each of these projects has attracted significant private sector investment interest, but has not closed due to gaps in financing. The GEF funding will be used as concessional financing to help projects get to closing and

begin implementation. The GEF funding will be offered at the minimum concessionality needed for each project to ensure no crowding out of private sector investment. Renewable energy projects will deliver an expected expansion of 65 MW of capacity and enable the reduction of 220 kilotonnes (kt) CO₂ eq annually. Additional benefits will include more reliable electricity supply and reduced pressure on biomass resources.

IDB-PPP MIF PUBLIC-PRIVATE PARTNERSHIP PROGRAM

This programmatic initiative will make targeted equity investments in funds to promote energy efficiency, renewable energy, and biodiversity in Latin America. Three leading funds have been selected for negotiation. Each has identified a pipeline of investments and has already attracted significant private sector investment interest, but has not closed due to gaps in financing. The GEF funding will be used to help projects get to closing and begin implementation. The GEF principal and any investment returns will flow back to the GEF Trust Fund, contributing to sustainable use of the private sector set-aside. Among the benefits from the investments over the project lifetime will be at least 7 Mt CO₂ eq abated. The program employs a unique partnership with the MIF of the IDB, which will provide funding for all necessary technical assistance and project preparation.





GEF as a Catalytic Supporting Institution for Technology Transfer

Dissemination of GEF experiences and successfully demonstrated ESTs within the Poznan Strategic Program

Within the Poznan Strategic Program, the GEF launched an initiative to support the dissemination of GEF experiences and successfully demonstrated ESTs. The initiative had two main objectives. The first was to provide a better, more in-depth understanding of the technology transfer process and the role of the GEF by developing case studies for specific technologies. The second was to disseminate to a wider range of countries and audiences the technologies that have already been successfully demonstrated with GEF support—with a view to facilitating wider adoption of those technologies. This dissemination initiative is managed by the GEF Secretariat in collaboration with relevant GEF Agencies and other interested parties.

Within this framework, the GEF has organized or participated in key meetings, forums, and side events, such as:

- *The Ministerial Meeting on Technology Transfer: Challenges and Opportunities.* This meeting was organized on 20 April 2011 in partnership with the Government of France, which, as the Chair of the G20, sought to make progress on the subject of technology transfer with a view to contributing to the ongoing discussions to operationalize key elements of the Cancun Agreements related to technology transfer. The

meeting was convened in partnership with the Forum Francophone des Affaires (Francophone Business Forum). The participants included a significant number of ministers, senior representatives from international organizations, including the UNFCCC secretariat and the GEF Agencies, as well as private sector institutions. The meeting addressed technology transfer challenges and opportunities, including a presentation of a model pilot proposal for establishing and implementing the regional climate technology centers and network with GEF support. The meeting summary is available from the GEF.

- *COP 16 Side Event From Innovation to Market Transformation: the Role of the GEF in Technology Transfer.* The GEF organized this side event on 2 December 2010, highlighting the role played by the GEF in facilitating technology transfer from innovation to market transformation to help address climate change challenges for both mitigation and adaptation. The event featured country experiences in technology transfer activities supported by the GEF, notably from Egypt, Jordan, and Mexico. In addition, the event introduced the Long-Term Program on Technology Transfer.
- *COP 17 Side Event “GEF Innovations and Technology Transfer,”* 3 December 2011. The objective of the meeting was to share information about the GEF’s innovative approaches to technology transfer as well as to launch the first GEF-funded pilot regional climate technology finance center and network in the Asia-Pacific region.
- *COP 17 “Joint SBI/SBSTA Forum on the Impact of the Implementation of Response Measures,”* 1 December 2011. The GEF Secretariat participated in this forum in response to a request from the UNFCCC Secretariat, where it delivered a presentation on technology transfer.

Capitalizing upon the extensive experience of the GEF partnership, the GEF also published and updated the following documents:

- In 2010, the GEF published a Booklet on Poznan Strategic Program on Technology Transfer. This publication presented the Poznan Strategic Program on Technology Transfer, providing updates on GEF’s contribution as well as progress. The present document, *Implementing the Poznan Strategic and Long-Term Programs on Technology Transfer*, is an update of this booklet with an expanded scope.
- In 2010, the GEF published a Booklet on *Transfer of Environmentally Sound Technologies—Case Studies from GEF Climate Change Portfolio*. The GEF technology transfer investments have generated not only significant emissions reductions, but a body of knowledge and lessons learned that are informing today’s technology transfer activities. This publication has been updated in 2012 and features some of the key ESTs supported by the GEF to date, encompassing the areas of renewable energy, energy efficiency, sustainable transport, and innovative financing. The case studies provide background information, project description, technology description, as well as results and outcomes. The common features of successful EST transfer projects are identified to inform future projects.
- The GEF prepared a publication on lessons learned in the past 20 years for release during the United Nations Conference on Sustainable Development – the Rio+20 Summit. The book, *From Rio to Rio: A 20-Year Journey to Green the World’s Economies*, includes case studies on climate technology transfer (<http://www.thegef.org/gef/pubs/from-rio-to-rio>).
- The GEF published a book on energy efficiency in November 2012 entitled *Closing the Gap: GEF*



COP 17 Side Event: “GEF Innovations and Technology Transfer,” 3 December 2011

Experiences in Global Energy Efficiency, and also issued an executive summary of this work in a booklet form.

The above information and more is available at the GEF Technology Transfer website. This GEF website is updated periodically with specific information on technology transfer, and can be accessed from: <http://www.thegef.org/gef/TT>.

The Long-Term Program on Technology Transfer: GEF as a Catalytic Supporting Institution for Technology Transfer

The Long-Term Program on Technology Transfer seeks to utilize the institutional capacity of the GEF to implement and enhance technology transfer. With a cadre of professionals with extensive programming and policy experience in different sectors, the GEF is well-positioned to be a catalytic global supporter of innovative approaches while incorporating guidance on technology transfer from the UNFCCC COP.

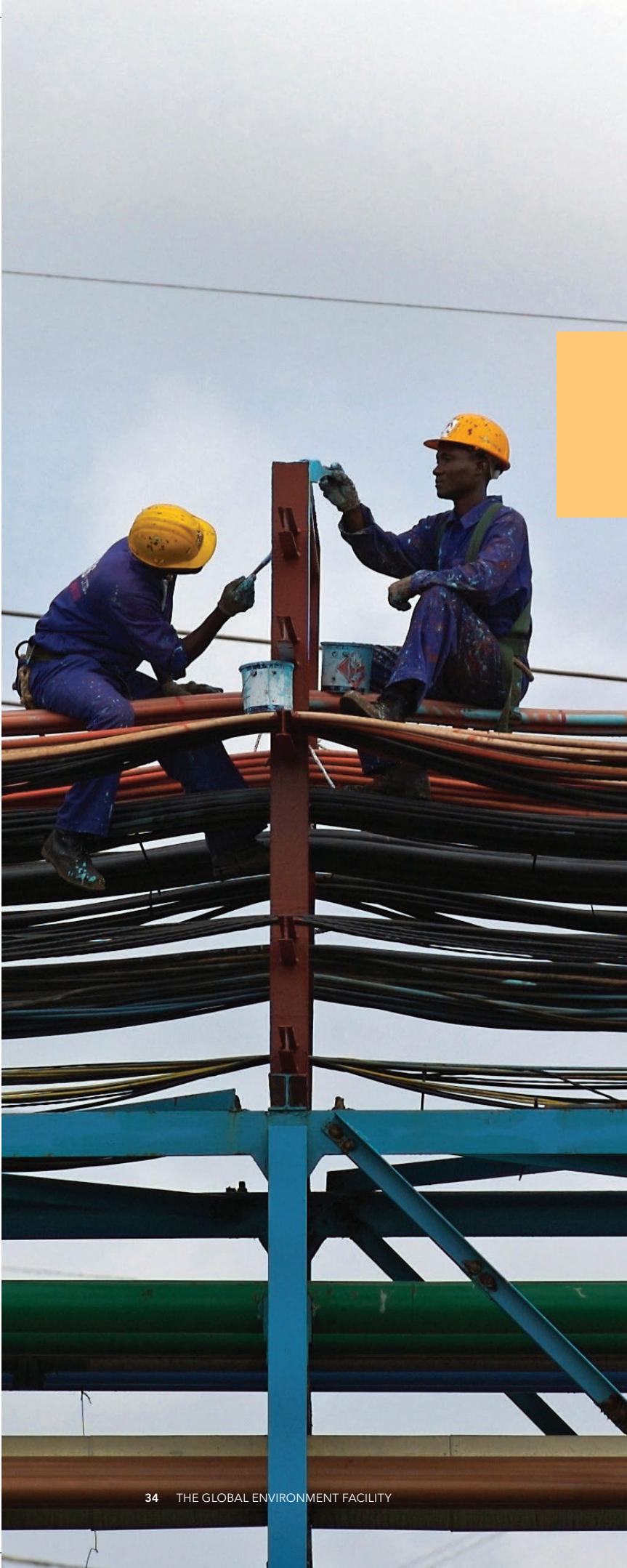
The GEF's catalytic role supporting technology transfer, highlighted by the investment and technical assistance

activities detailed in previous sections, is complemented by its outreach efforts. In order to raise awareness of its support for technology transfer, including the Poznan Strategic Program and its long-term elements, the GEF publicly presents its technology transfer activities regularly at a variety of meetings, including its funding opportunities for adaptation projects. Beside the meetings listed in the previous section, the GEF also organizes:

- An annual GEF Familiarization Seminar (last occasion in January 2012);
- GEF Expanded Constituency Workshops (ECWs). Between July 2011 and June 2012, the GEF held ECWs in:
 - Dakar, Senegal (July 2011);
 - Monrovia, Liberia (July 2011);
 - Honiara, Solomon Islands (September 2011);
 - Tashkent, Uzbekistan (October 2011);
 - Nairobi, Kenya (October 2011);
 - Cape Town, South Africa (November, 2011);
 - Bujumbura, Burundi (February 2012);
 - Dead Sea, Jordan (February 2012);
 - San Jose, Costa Rica (March 2012);
 - Tirana, Albania (March 2012);
 - Ouagadougou, Burkina Faso (April 2012);
 - Antigua and Barbuda (May 2012); and
 - Lima, Peru (May 2012).

These meetings include the UNFCCC national focal points as participants.





GEF-5 and Technology Transfer

The GEF-5 climate change mitigation strategy charts a course to promote a broad portfolio of environmentally sound, climate-friendly technologies that will achieve large GHG reductions in GEF-recipient countries in accordance with national circumstances. The entire climate change mitigation portfolio for GEF-5 supports technology transfer, as defined by the IPCC and the technology transfer framework outlined by the COP. This support is reflected in the GEF strategy's six climate change mitigation objectives:

- Promote the demonstration, deployment, and transfer of innovative, low-carbon technologies
- Promote market transformation for energy efficiency in the industrial and buildings sectors
- Promote investment in renewable energy technologies
- Promote energy-efficient, low-carbon transport and urban systems
- Promote conservation and enhancement of carbon stocks through sustainable management of Land Use, Land-Use Change, and Forestry
- Support enabling activities and capacity building

The strategy promotes technology transfer at various stages of technology development in the innovation chain, from demonstration of innovative, emerging, low-carbon technologies to diffusion of commercially proven, ESTs and practices. The GEF support involves a combination of technology push and market pull interventions.

Objective 1: Promote the demonstration, deployment, and transfer of innovative low-carbon technologies.

This objective is geared toward promoting the demonstration, deployment, and transfer of innovative low-carbon technologies. Projects supported under this objective

target innovative technologies with potentially significant long-term impacts on carbon emissions. The GEF support may involve the demonstration, deployment, and transfer of commercially available technologies that were identified as priorities by the recipient countries but have not been widely adopted in their particular markets. The GEF support includes technical assistance for creating an enabling policy environment for technology transfer, North-South, and South-South technology cooperation, purchase of technology licenses, and investment in pilot projects. The GEF can also support technology centers and networks at the global, regional, and national levels, in accordance with UNFCCC guidance and the priorities of the GEF recipient countries. Technologies at the diffusion stage or those in wide-scale dissemination are considered under other objectives.

Objective 2: Promote market transformation for energy efficiency in the industrial and buildings sectors. This objective aims to expand investment in energy efficiency in the industrial and buildings sectors. Projects supported under this objective aims to step up policy interventions and scale up energy efficient investments. For industry, emphasis is placed on energy-efficient industrial production and manufacturing, particularly in SMEs. For buildings, the GEF support covers the building envelope; energy-consuming systems; appliances; and equipment used for heating, cooling, lighting, and building operations. Emphasis is also placed on integrated and systemic approaches. Promotion of energy-efficient cook stoves will also be covered. Projects under this objective may extend to supporting the phase-out of HCFCs used in industry and buildings prior to the phase-out dates under the Montreal Protocol.

Objective 3: Promote investment in renewable energy technologies. This objective aims to further boost investment in renewable energy technologies by moving beyond the creation of enabling policy and regulatory environments. Projects supported under this objective lead to a step change in the deployment and diffusion of reliable, least-cost renewable energy technologies. The GEF support may cover on-grid renewable energy, decentralized production of electric power, as well as heating with indigenous energy sources, including biomass, solar, wind, hydro, and geothermal. The GEF support could also cover sustainable production of biomass for bio-fuels, as a substitute for fossil fuels where appropriate conditions exist, and methane recovery from biomass wastes for power and heat generation. The GEF projects can promote local SMEs to enhance their technical capacities to provide installation, operation, and management support.

Objective 4: Promote energy-efficient low-carbon transport and urban systems. This objective supports interventions for land use and transport planning, public transit systems, energy efficiency improvement of the fleet, efficient traffic control and management, transport demand management, and non-motorized transport. Technological options in the transport sector, such as clean, low-carbon vehicles, may be considered in countries where such options can be expected to achieve significant reductions in GHG emissions as well local development environmental benefits. The GEF support under this objective may involve technical assistance, innovative financing mechanisms, awareness campaigns, and investments in demonstration and deployment of high-performance technologies.

Objective 5: Promote conservation and enhancement of carbon stocks through sustainable management of Land Use, Land-Use Change, and Forestry. This objective aims to conserve, restore, enhance, and manage carbon stocks in forest and non-forest lands, and to prevent emissions of the carbon stocks by reducing the pressure on these lands in the wider landscape. Deploying low carbon technologies may reduce demands from resources produced by land management, and simultaneously adopting and deploying new land management responses can synergistically enhance and sustain carbon sequestration and conserve stocks. The GEF support could include development of national systems to measure and monitor carbon stocks and fluxes from forest and non-forest lands, policy and institutional strengthening, local community good practices, and establishment of financing mechanisms or investment programs.

Objective 6: Support enabling activities and capacity building. This objective aims to provide support for non-Annex I parties to prepare their National Communications to the UNFCCC and meet their obligations under the Convention. The GEF also continues to fund the preparation and updating of TNAs in accordance with Convention guidance.

The GEF-5 strategy for climate change draws on past experiences and is guided by three principles of responsiveness to Convention guidance, consideration of the national circumstances of recipient countries, and cost-effectiveness in achieving global environmental benefits. The GEF-5 phase endeavors to exert a transformative impact in helping GEF-recipient countries to move along a low-carbon development path through investment in, and market transformation of, environmentally sound, climate-friendly technologies.

Appendix

TABLE 3 CLIMATE CHANGE MITIGATION TECHNOLOGY TRANSFER PILOT PROJECTS SUPPORTED IN LINE WITH THE LONG-TERM PROGRAM ON TECHNOLOGY TRANSFER AS OF JUNE 30, 2012

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO-FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|--------------------|--------|---|-------------------|--|-------------------------------|------------------------|
| Albania | WB | Environmental Services Project | LFSM | 3.2 | 22.6 | 25.7 |
| Argentina | IDB | Introduction of Energy Efficiency and Renewable Energy Measures in Design, Construction and Operation of Social Housing and Community Equipment | TT, EE | 11.3 | 44.5 | 55.8 |
| Armenia | UNDP | Green Urban Lighting | EE | 1.8 | 8.6 | 10.4 |
| Azerbaijan | UNDP | Sustainable Land and Forest Management in the Greater Caucasus Landscape | LSFM | 6.3 | 11.4 | 17.7 |
| Bangladesh | UNDP | Development of Sustainable Renewable Energy Power Generation | RE | 4.6 | 29.8 | 34.4 |
| Bangladesh | ADB | ASTUD: Greater Dhaka Sustainable Urban Transport Corridor Project ^d | TU | 5 | 250.4 | 255.4 |
| Belarus | UNDP | Removing Barriers to Wind Power Development in Belarus | RE | 3.4 | 17.1 | 20.5 |
| Belarus | UNDP | Landscape Approach to Management of Peatlands Aiming at Multiple Ecological Benefits | LSFM | 3 | 10.5 | 13.5 |
| Belize | WB | Management and Protection of Key Biodiversity Areas | LFSM | 6.8 | 16 | 22.8 |
| Bolivia | UNDP | Fifth Operational Phase of the GEF Small Grants Program in Bolivia | SGP, RE, LF | 4.5 | 6 | 10.5 |
| Bosnia-Herzegovina | WB | Sustainable Forest and Abandoned Land Management | LFSM | 6.1 | 18.4 | 24.5 |
| Brazil | UNDP | Production of Sustainable, Renewable Biomass-based Charcoal for the Iron and steel Industry in Brazil | EE, RE | 7.9 | 32.7 | 40.6 |
| Brazil | UNDP | Fifth Operational Phase of the GEF Small Grants Program in Brazil | SGP, LF | 5.4 | 5.1 | 10.5 |
| Brazil | IDB | Recovery and Protection of Climate and Biodiversity Services in the Paraíba do Sul Basin of the Atlantic Forest of Brazil | LFSM | 29.3 | 168.8 | 198.1 |
| Brazil | IDB | Consolidation of National System of Conservation Units (SNUC) and Enhanced Flora and Fauna Protection | LFSM | 35.9 | 128.2 | 164.1 |
| Cameroon | UNIDO | Promoting Investments in the Fight against Climate Change and Ecosystems Protection through Integrated Renewable Energy and Biomass Solutions for Productive Uses and Industrial Applications | RE | 2.2 | 10 | 12.2 |
| Cameroon | FAO | Sustainable Forest Management Under the Authority of Cameroonian Councils | LFSM | 3.9 | 16.2 | 20.1 |
| Chile | UNDP | Supporting Civil Society and Community Initiatives to Generate Global Environmental Benefits using Grants and Micro Loans in the Mediterranean Ecoregion | LF | 3.6 | 15.3 | 18.9 |

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO- FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|--------------------|--------|--|-------------------|--|--------------------------------|------------------------|
| China | ADB | Hebei Energy Efficiency Improvement and Emission Reduction Project | EE | 4 | 189 | 193 |
| China | UNIDO | Promoting Energy Efficiency in Industrial Heat Systems and High Energy-consuming (HEC) Equipment | EE | 5.9 | 40.5 | 46.4 |
| China | WB | Urban-Scale Building Energy Efficiency and Renewable Energy | EE, RE | 13.2 | 152.1 | 165.3 |
| China | WB | Establish Measurement and Verification System for Energy Efficiency in China | EE | 19.6 | 104 | 123.6 |
| China | WB | China Renewable Energy Scaling-Up Program (CRESP) Phase II | RE | 30 | 444.1 | 474.1 |
| China | WB | GEF Large-City Congestion and Carbon Reduction Project | TU | 20 | 88.3 | 108.3 |
| China | WB | Green Energy Schemes for Low-Carbon City in Shanghai, China | TT, EE, RE, TU | 4.9 | 247.2 | 252.1 |
| Colombia | IDB | Low-carbon and Efficient National Freight Logistics Initiative | TU | 3.4 | 16.2 | 19.6 |
| Costa Rica | UNDP | Fifth Operational Phase of the GEF Small Grants Program in Costa Rica | SGP, RE, LF | 4.8 | 4.6 | 9.4 |
| Dominican Republic | UNIDO | Stimulating Industrial Competitiveness Through Biomass-based, Grid-connected Electricity Generation | RE | 1.5 | 7.5 | 9 |
| Global | UNEP | SolarChill Development, Testing and Technology Transfer Outreach | TT | 3 | 5.7 | 8.6 |
| Global | UNEP | Stabilizing GHG Emissions from Road Transport Through Doubling of Global Vehicle Fuel Economy: Regional Implementation of the Global Fuel Efficiency Initiative (GFEI) | TU | 1.9 | 13.5 | 15.3 |
| Global | UNDP | Fifth Operational Phase of the GEF Small Grants Program—Implementing the program using STAR resources I | SGP, TT, TU, LF | 37.4 | 35.9 | 73.3 |
| Global | UNEP | The GLOBE Legislator Forest Initiative | LF | 1.1 | 1.2 | 2.3 |
| Global | UNDP | Fifth Operational Phase of the GEF Small Grants Program | SGP, TT, TU, LF | 140 | 134.6 | 274.6 |
| Guatemala | UNDP | Sustainable Forest Management and Multiple Global Environmental Benefits | LFSM | 4.9 | 13.2 | 18.1 |
| Guyana | IDB | Sustainable Energy Program | RE | 5.5 | 23.4 | 28.9 |
| India | UNIDO | Promoting Business Models for Increasing Penetration and Scaling up of Solar Energy | TT | 4.8 | 21.8 | 26.6 |
| India | UNIDO | Promoting Industrial Energy Efficiency through Energy Management Standard, System Optimizatoin and Technology Incubation | TT, EE | 4.9 | 27.4 | 32.3 |
| India | WB | Partial Risk Sharing Facility for Energy Efficiency | EE | 19.8 | 594.3 | 614.1 |
| India | WB | Efficient and Sustainable City Bus Services | TU | 10.1 | 85 | 95.1 |
| India | WB | Facility for Low Carbon Technology Deployment | TT | 9.9 | 59.3 | 69.2 |
| India | WB | Integrated Biodiversity Conservation and Ecosystem Services Improvement | LFSM | 22.6 | 115 | 137.6 |
| India | UNDP | Fifth Operational Phase of the GEF Small Grants Program in India | SGP, EE, RE | 5.4 | 6 | 11.4 |
| Kazakhstan | EBRD | Reducing GHG Emissions through a Resource Efficiency Transformation Programme (ResET) for Industries in Kazakhstan | EE | 7.8 | 38.5 | 46.3 |
| Kenya | UNDP | Fifth Operational Phase of the GEF Small Grants Program in Kenya | SGP, RE | 5.4 | 5.5 | 10.9 |

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO-FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|--------------------|----------|--|--------------------|--|-------------------------------|------------------------|
| Kyrgyz Republic | FAO | Sustainable Management of Mountainous Forest and Land Resources under Climate Change Conditions | LFSM | 6 | 17.1 | 23.1 |
| Lao PDR | WB | Strengthening Protection and Management Effectiveness for Wildlife and Protected Areas ^d | LFSM | 7.4 | 17.6 | 25 |
| Lebanon | UNDP | Small Decentralized Renewable Energy Power Generation | RE | 1.6 | 9.7 | 11.4 |
| Liberia | WB | Lighting One Million Lives in Liberia | RE | 1.6 | 4.1 | 5.6 |
| Malaysia | UNIDO | GHG Emissions Reductions In Targeted Industrial Sub-Sectors Through EE And Application Of Solar Thermal Systems | EE, RE | 4.4 | 20 | 24.4 |
| Maldives | UNEP | Strengthening Low-Carbon Energy Island Strategies | EE | 4.3 | 21.3 | 25.6 |
| Mexico | WB | Conservation of Coastal Watersheds in Changing Environments | LFSM | 43.5 | 239.9 | 283.4 |
| Mexico | UNDP | Fifth Operational Phase of the GEF Small Grants Program in Mexico | SGP, LFSM | 4.8 | 5.9 | 10.7 |
| Nepal | UNDP | Renewable Energy for Rural Livelihood (RERL) | RE | 3.4 | 14.6 | 17.9 |
| Nigeria | WB | Small-scale Associated Gas Utilization | TT | 3 | 30.6 | 33.6 |
| Pakistan | UNIDO | Sustainable Energy Initiative for Industries | EE, RE | 4 | 32.7 | 36.7 |
| Pakistan | UNDP | Fifth Operational Phase of the GEF Small Grants Program in Pakistan | SGP, EE, RE, LF | 3 | 3.6 | 6.6 |
| Peru | UNDP | Nationally Appropriate Mitigation Actions in the Energy Generation and End-Use Sectors | EE, RE, EA | 5 | 29.5 | 34.4 |
| Regional (AP) | ADB/UNEP | Pilot Asia-Pacific Climate Technology Network and Finance Center | TT | 12 | 74.5 | 86.5 |
| Regional (AFR) | AfDB | Pilot African Climate Technology Finance Center and Network ^c | TT, EE, RE, TU | 15.8 | 95 | 110.8 |
| Regional (ECA) | EBRD | Regional Climate Technology Transfer Center ^c | TT, EE | 12 | 77 | 89 |
| Regional (LAC) | IDB | Climate Technology Transfer Mechanisms and Networks in Latin America and the Caribbean ^c | TT, EE, RE, TU, LF | 12 | 63.4 | 75.4 |
| Regional (LAC) | UNEP | Multiplying Environmental and Carbon Benefits in High Andean Ecosystems | LFSM | 5.3 | 18.2 | 23.4 |
| Russian Federation | EBRD | ARCTIC Targeted Support for Energy Efficiency and Renewable Energy in the Russian Arctic ^d | EE, RE | 6.7 | 81 | 87.7 |
| Russian Federation | UNEP | ARCTIC Conserving Biodiversity in the Changing Arctic ^d | LF | 6.2 | 14.2 | 20.5 |
| Russian Federation | UNEP | ARCTIC Improvement of Environmental Governance and Knowledge Management for SAP-Arctic Implementation ^d | TT, EE | 2.4 | 9.9 | 12.2 |
| Russian Federation | WB | ARCTIC Environment Project (Financial Mechanism for Environmental Rehabilitation in Arctic) ^d | EE, RE | 6 | 230 | 236 |
| Russian Federation | WB | Russia Energy Efficiency Financing (REEF) Project | EE | 25 | 825 | 850 |
| Serbia | UNDP | Reducing Barriers to Accelerate the Development of Biomass Markets in Serbia | RE | 3.2 | 14 | 17.2 |
| South Africa | UNIDO | Greening the COP 17 in Durban | TT, RE, TU | 1.1 | 1.4 | 2.5 |
| Suriname | IDB | Development of Renewable Energy, Energy Efficiency and Electrification of Suriname | EE, RE | 4.8 | 21.5 | 26.3 |

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO- FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|-------------|--------|--|-------------------|--|--------------------------------|------------------------|
| Thailand | WB | GMS-FBP Strengthening Capacity and Incentives for Wildlife Conservation in the Western Forest Complex ^d | LFSM | 8 | 29.4 | 37.4 |
| Timor Leste | UNDP | Promoting Sustainable Bio-energy Production from Biomass | RE | 2 | 7 | 9 |
| Turkey | WB | Small and Medium Enterprise Energy Efficiency Project | EE | 4 | 252.5 | 256.5 |
| Turkey | FAO | Sustainable Land Management and Climate Friendly Agriculture | TT, LF | 6.3 | 21.3 | 27.6 |
| Turkey | UNDP | Integrated Approach to Management of Forests in Turkey, with Demonstration in High Conservation Value Forests in the Mediterranean Region | RE, LFSM | 8 | 21.2 | 29.2 |
| Uganda | UNDP | Addressing Barriers to the Adoption of Improved Charcoal Production Technologies and Sustainable Land Management practices through an integrated approach | RE, LFSM | 3.9 | 7.6 | 11.5 |
| Ukraine | UNDP | Development and Commercialization of Bioenergy Technologies | RE | 5.3 | 27.8 | 33.1 |
| Ukraine | UNIDO | Introduction of Energy Management System Standard in Ukrainian Industry | EE | 6.2 | 39.8 | 45.9 |
| Ukraine | UNEP | Conserving, Enhancing and Managing Carbon Stocks and Biodiversity while Promoting Sustainable Development in the Chernobyl Exclusion Zone through the Establishment of a Research and Environmental Protection Centre and Protected Area | LF | 5.5 | 15 | 20.5 |
| Uruguay | UNIDO | Towards a Green Economy in Uruguay: Stimulating Sustainable Production Practices and Low-emission Technologies in Prioritized Sectors | TT, RE | 3.8 | 19.8 | 23.6 |
| Uzbekistan | WB | Sustainable Agriculture and Climate Change Mitigation Project | TT, EE, RE | 14 | 75 | 89 |
| Vietnam | UNDP | Promotion of Non-fired Brick (NFB) Production and Utilization | EE | 3.2 | 36.1 | 39.3 |
| Vietnam | UNIDO | Implementation of Eco-industrial Park Initiative for Sustainable Industrial Zones in Vietnam | TT | 3.9 | 14.2 | 18 |
| Zambia | UNDP | Strengthening Management Effectiveness and Generating Multiple Environmental Benefits within and around Protected Areas in Zambia | RE, LFSM | 14.6 | 44.8 | 59.4 |
| Zimbabwe | WB | Hwange-Sanyati Biological Corridor (HSBC) Environment Management and Conservation Project | LFSM | 6.4 | 23.2 | 29.6 |
| | | TOTAL | | 835.6 | 5891.8 | 6726.6 |

a EE: energy efficiency, RE: renewable energy, SGP: Small Grants Program, TU: sustainable transport and urban systems, LF: land use, land-use change and forestry (LULUCF), LFSM: LULUCF&SFM/REDD+, TT: demonstration, deployment, and transfer of innovative low-carbon technologies.

b These amounts include all focal area contributions, including project preparation grants and Agency fees. The total GEF Amount includes \$322 million from other focal areas or trust funds, including SCCF and LDCF.

c Multi-trust fund project, including funding from SCCF.

d Child project under the programmatic approaches.

TABLE 4 CLIMATE CHANGE ADAPTATION TECHNOLOGY TRANSFER PILOT PROJECTS SUPPORTED IN LINE WITH THE LONG-TERM IMPLEMENTATION PROGRAM ON TECHNOLOGY TRANSFER AS OF JUNE 30, 2012

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO-FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|--------------------------|---------------|---|-------------------|--|-------------------------------|------------------------|
| Afghanistan | UNEP | Building Adaptive Capacity and Resilience to Climate Change in Afghanistan. | WRM | 5.5 | 16.0 | 21.5 |
| Azerbaijan | UNDP | Integrating climate change risks into water and flood management by vulnerable mountainous communities in the Greater Caucasus region of Azerbaijan | DRM, EWS | 3.1 | 7.3 | 10.3 |
| Benin | UNDP | Integrated Adaptation Programme to Combat the Effects of Climate Change on Agricultural Production and Food Security | AG, FS | 3.8 | 7.9 | 11.7 |
| Benin | UNDP | Strengthening Climate Information and Early Warning Systems in Western and Central Africa for Climate Resilient Development and Adaptation to Climate Change—Benin | HM, EWS | 4.5 | 18.1 | 22.6 |
| Burkina Faso | UNDP | Strengthening Climate Information and Early Warning Systems in Western and Central Africa for Climate Resilient Development and Adaptation to Climate Change—Burkina Faso | HM, EWS | 4.5 | 24.3 | 28.8 |
| Cambodia | UNDP | Promoting Climate-Resilient Water Management and Agricultural Practices | AG, FS, WRM | 2.1 | 2.2 | 4.4 |
| Central African Republic | UNDP | Integrated Adaptation Programme to Combat the Effects of Climate Change on Agricultural Production and Food Security in CAR | AG, FS | 3.1 | 5.6 | 8.7 |
| China | WB | Mainstreaming Adaptation to Climate Change Into Water Resources Management and Rural Development | WRM, AG | 5.8 | 50.5 | 56.3 |
| Colombia | IDB | Adaptation to Climate Impacts in Water Regulation and Supply for Bogota's Metropolitan Area | WRM | 4.6 | 23.3 | 27.9 |
| Comoros | UNDP/ UNEP | Adapting Water Resource Management in Comoros to Increase Capacity to Cope with Climate Change | WRM | 4.2 | 9.3 | 13.5 |
| Comoros | UNDP | Enhancing adaptive capacity and resilience to climate change in the agriculture sector in Comoros | AG, HM, EWS | 10.0 | 35.0 | 45.0 |
| Congo DR | UNDP | Building the Capacity of the Agriculture Sector in DR Congo to Plan for and Respond to the Additional Threats Posed by Climate Change on Food Production and Security | AG, FS | 3.4 | 4.1 | 7.5 |
| Djibouti | UNEP | Implementing NAPA Priority Interventions to Build Resilience in the most Vulnerable Coastal Zones in Djibouti | CZM | 2.4 | 2.4 | 4.8 |
| Egypt | UNDP | Adaptation to Climate Change in the Nile Delta Through Integrated Coastal Zone Management | CZM | 4.5 | 12.8 | 17.3 |

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO-FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|------------|--------|---|-------------------|--|-------------------------------|------------------------|
| Ethiopia | UNDP | Strengthening climate information and early warning systems in Ethiopia to support climate resilient development | HM, EWS | 5.5 | 20.8 | 26.3 |
| Ethiopia | UNDP | Coping with Drought and ClimateChange | DRM, HE, AG | 1.1 | 1.9 | 3.0 |
| Ghana | IFAD | Promoting Value Chain Approach to Adaptation in Agriculture | AG, FS | 2.9 | 9.0 | 11.8 |
| Global | UNEP | Enhancing Capacity, Knowledge and Technology Support to Build Climate Resilience of Vulnerable Developing Countries | TT | 5.5 | 23.0 | 28.5 |
| Haiti | UNDP | Strengthening Adaptive Capacities to Address Climate Change Threats on Sustainable Development Strategies for Coastal Communities in Haiti | CZM | 4.0 | 9.8 | 13.7 |
| Haiti | FAO | Strengthening climate resilience and reducing disaster risk in agriculture to improve food security in Haiti post earthquake | AG, FS, DRM | 3.0 | 9.3 | 12.3 |
| Honduras | IFAD | Competitiveness and Sustainable Rural Development Project in the Northern Zone | AG | 3.4 | 21.0 | 24.4 |
| India | ADB | Climate Resilient Coastal Protection and Management | CZM | 2.0 | 54.7 | 56.7 |
| Lao PDR | UNDP | Improving the Resilience of the Agriculture Sector in Lao PDR to Climate Change Impacts | AG, FS | 5.0 | 7.7 | 12.7 |
| Lao PDR | UNDP | Effective Governance for Small Scale Rural Infrastructure and Disaster Preparedness in a Changing Climate | DRM, INF | 5.3 | 25.9 | 31.2 |
| Lesotho | UNEP | Improvement of Early Warning System to Reduce Impacts of Climate Change and Capacity Building to Integrate Climate Change into Development Plans | HM, EWS | 2.0 | 2.7 | 4.7 |
| Lesotho | IFAD | Adaptation of Small-scale Agriculture Production (ASAP) | AG, FS | 4.9 | 13.0 | 17.9 |
| Liberia | UNDP | Enhancing Resilience of Vulnerable Coastal Areas to Climate Change Risks | CZM | 3.3 | 4.7 | 8.0 |
| Liberia | UNDP | Enhancing Resilience to Climate Change by Mainstreaming Adaption Concerns into Agricultural Sector Development in Liberia | AG, FS | 2.7 | 6.3 | 9.0 |
| Liberia | UNDP | Strengthening Liberia's Capability to Provide Climate Information and Services to Enhance Climate Resilient Development and Adaptation to Climate Change. | HM, EWS | 7.5 | 28.4 | 35.9 |
| Malawi | UNDP | Strengthening climate information and early warning systems in Malawi to support climate resilient development | HM, EWS | 4.5 | 17.1 | 21.6 |
| Maldives | UNDP | Increasing Climate Change Resilience of Maldives through Adaptation in the Tourism Sector | TO | 1.8 | 1.7 | 3.5 |
| Mali | UNDP | Enhancing Adaptive Capacity and Resilience to Climate Change in the Agriculture Sector in Mali | AG, FS | 2.7 | 8.5 | 11.2 |
| Mauritania | IFAD | Support to the Adaptation of Vulnerable Agricultural Production Systems | AG, FS | 4.0 | 10.5 | 14.4 |
| Moldova | IFAD | Climate resilience through conservation agriculture | AG | 4.8 | 13.8 | 18.6 |

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO-FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|-----------------------|-----------|---|-------------------|--|-------------------------------|------------------------|
| Mozambique | UNDP | Adaptation in the coastal zones of Mozambique | CZM | 5.0 | 9.7 | 14.7 |
| Mozambique | UNDP | Coping with Drought and Climate Change | DRM, HE, AG | 1.0 | 0.9 | 2.0 |
| Niger | UNDP | Implementing NAPA Priority Interventions to Build Resilience and Adaptive Capacity of the Agriculture Sector to Climate Change | AG, FS | 3.9 | 11.0 | 14.8 |
| Regional (LAC) | WB | Design and Implementation of Pilot Climate Change Adaptation Measures in the Andean Region | DRM, EWS | 8.8 | 25.2 | 34.1 |
| Regional (AP) | ADB/ UNEP | Pilot Asia-Pacific Climate Technology Network and Finance Center ^c | TT | 2.0 | 15.0 | 17.0 |
| Regional (LAC) | IADB | Climate technology transfer mechanisms and networks in Latin America and the Caribbean ^c | TT | 2.0 | 6.3 | 8.3 |
| Regional (ECA) | AfDB | Pilot African Climate Technology Finance Center and Network ^c | TT | 5.8 | 32.0 | 37.8 |
| Regional (ECA) | EBRD | Regional Climate Technology Transfer Center ^c | TT | 2.0 | 12.6 | 14.6 |
| Sao Tome and Principe | WB | Sao Tome and Principe Adaptation to Climate Change | CZM | 4.9 | 13.2 | 18.0 |
| Sao Tome and Principe | AfDB | Strengthening the Adaptive Capacity of Most Vulnerable Sao Tomean's Livestock-keeping Households | AG, FS | 2.3 | 7.7 | 10.0 |
| Sao Tome and Principe | UNDP | Strengthening Climate Information and Early Warning Systems in Western and Central Africa for Climate Resilient Development and Adaptation to Climate Change — Sao Tome and Principe | HM, EWS | 4.5 | 17.9 | 22.4 |
| Senegal | IFAD | Climate Change adaptation project in the areas of watershed management and water retention | AG, FS | 5.6 | 10.2 | 15.8 |
| Sierra Leone | IFAD | Integrating Adaptation to Climate Change into Agricultural Production and Food Security in Sierra Leone | AG, FS | 3.0 | 8.6 | 11.6 |
| Sierra Leone | UNDP | Building adaptive capacity to catalyze active public and private sector participation to manage the exposure and sensitivity of water supply services to climate change in Sierra Leone | WRM | 3.3 | 25.6 | 28.9 |
| Sierra Leone | UNDP | Strengthening Climate Information and Early Warning Systems in Western and Central Africa for Climate Resilient Development and Adaptation to Climate Change — Sierra Leone | HM, EWS | 4.5 | 18.4 | 22.9 |
| Sudan | UNDP | Implementing NAPA Priority Interventions to Build Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change | AG, FS | 3.7 | 3.5 | 7.2 |
| Tanzania | UNEP | Developing Core Capacity to Address Adaptation to Climate Change in Productive Coastal Zones | CZM | 3.8 | 67.8 | 71.6 |
| Tanzania | UNDP | Strengthening climate information and early warning systems in Tanzania to support climate resilient development | HM, EWS | 4.5 | 19.8 | 24.3 |
| Togo | IFAD | Adapting Agriculture Production in Togo (ADAPT) | AG, FS | 6.0 | 13.0 | 19.0 |

| COUNTRY | AGENCY | TITLE | TYPE ^a | GEF AMOUNT ^b (\$ MILLIONS) | CO-FINANCING (\$ MILLIONS) | TOTAL (\$ MILLIONS) |
|----------|--------|--|-------------------|--|-------------------------------|------------------------|
| Uganda | UNDP | Strengthening climate information and early warning systems in Uganda to support climate resilient development | HM, EWS | 4.5 | 23.7 | 28.2 |
| Zambia | UNDP | Adaptation to the effects of drought and climate change in Agro-ecological Zone 1 and 2 in Zambia | AG, FS | 4.3 | 9.8 | 14.1 |
| Zambia | UNDP | Strengthening climate information and early warning systems in Zambia to support climate resilient development | HM, EWS | 4.4 | 23.7 | 28.1 |
| Zimbabwe | UNDP | Coping with Drought and Climate Change | DRM, HE, AG | 1.1 | 1.2 | 2.2 |
| | | TOTAL | | 228.5 | 885.1 | 1113.5 |

a WRM: Water resources management; DRM: Disaster risk management; EWS: Early warning systems; AG: Agriculture; FS: Food security; HM: Hydro-meteorology; CZM: Coastal zone management; TT: Technology transfer (cross-cutting); INF: Infrastructure development; HE: Health; TO: Tourism.

b These amounts include project preparation grants and Agency fees. All amounts accounted here are from the SCCF or the LDCF.

c Multi-trust fund project. Funding from the GEF Trust Fund (for a total of \$51.8 million) is not included here (please see Table 3 for GEF Trust Fund allocation).

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ABBREVIATIONS AND ACRONYMS

| | |
|--------------------------|--|
| ADB | Asian Development Bank |
| ACC | Agricultural Credit Corporation |
| AfDB | African Development Bank |
| AFR | Africa |
| AP | Asia and the Pacific |
| CO₂ eq | Carbon dioxide equivalent |
| COP | Conference of the Parties |
| CTCN | Climate Technology Center and Network |
| EBRD | European Bank for Reconstruction and Development |
| ECA | Europe and Central Asia |
| ECW | Expanded Constituency Workshop |
| EGTT | Expert Group on Technology Transfer |
| EST | Environmentally Sound Technology |
| FAO | Food and Agriculture Organization of the United Nations |
| FY | Fiscal Year |
| GEB | Global Environmental Benefit |
| GEF | Global Environment Facility |
| GHG | Greenhouse Gas |
| GWP | Global Warming Potential |
| IDB | Inter-American Development Bank |
| IFAD | International Fund for Agricultural Development |
| IPCC | Intergovernmental Panel on Climate Change |
| HCFC | Hydrochlorofluorocarbon |
| HFC | Hydrofluorocarbon |
| HVAC&R | Heating, Ventilation, Air-conditioning and Refrigeration |
| LAC | Latin America and the Caribbean |
| LDCF | Least Developed Countries Fund |
| LULUCF | Land Use, Land-use Change and Forestry |
| MIF | Multilateral Investment Fund |
| NAMA | Nationally Appropriate Mitigation Action |
| NAPA | National Adaptation Programme of Action |
| NGO | Non-Governmental Organization |
| ODP | Ozone Depleting Potential |
| PPP | Public-Private Partnership |
| PV | Photovoltaic |
| SBI | Subsidiary Body for Implementation |
| SBSTA | Subsidiary Body for Scientific and Technological Advice |
| SCCF | Special Climate Change Fund |
| SME | Small and Medium Enterprise |
| STAR | System for a Transparent Allocation of Resources |
| TAP | Technology Action Plan |
| TNA | Technology Needs Assessment |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNIDO | United Nations Industrial Development Organization |
| WB | World Bank |

UNITS OF MEASURE

| | |
|------------|-----------------|
| GW | Gigawatt |
| GWh | Gigawatt hour |
| kW | Kilowatt |
| Mt | Million tonnes |
| kt | Thousand tonnes |
| MW | Megawatt |
| MWh | Megawatt hour |

ABOUT THE GEF

The Global Environmental Facility unites 182 member governments—in partnership with international institutions, civil society organizations (CSOs), and the private sector—to address global environmental issues while supporting national sustainable development initiatives. An independent financial organization, the GEF provides grants to developing countries and countries with economies in transition for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. These projects benefit the global environment, linking local, national, and global environmental challenges and promoting sustainable livelihoods.

Established in 1991, the GEF is today the largest funder of projects to improve the global environment. The GEF has allocated \$10.5 billion, supplemented by more than \$51 billion in co-financing, for more than 2,700 projects in more than 165 developing countries and countries with economies in transition. Through its Small Grants Programme, the GEF has also made more than 14,000 small grants directly to civil society and community based organizations, totaling \$634 million.

The GEF partnership includes 10 Agencies: the UN Development Programme, the UN Environment Programme, the World Bank, the UN Food and Agriculture Organization, the UN Industrial Development Organization, the African Development Bank, the Asian Development Bank, the European Bank for Reconstruction and Development, the Inter-American Development Bank, and the International Fund for Agricultural Development. The Scientific and Technical Advisory Panel provides technical and scientific advice on the GEF's policies and projects. For more information, visit www.thegef.org.

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