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Cover: Anthropogenic activities such as deforestation coupled with erratic weather patterns have exacerbated flooding of vital ecosystems, Lake Nakuru, Kenya; by Anupam Anand/GEF IEO

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Foreword

The Climate Change Focal Area Study is 1 of 29 evaluations conducted for the Sixth Comprehensive Evaluation (OPS6) of the Global Environment Facility (GEF). Over 10 years have passed since the last climate change focal area study. This evaluation comes at a critical point in time, with the global landscape for climate change financing evolving significantly since the GEF first became the operating entity of the Financial Mechanism of the United Nations Framework Convention on Climate Change in 1996. New institutions such as the Climate Investment Funds and the Green Climate Fund have been established with pledged amounts that far exceed those of the GEF.

The purpose of this study is to provide insights and lessons for GEF-7 based on evidence from an analysis of the climate change portfolio, terminal evaluations of completed projects, mapping of convention guidance to the GEF-6 strategy and programming, interviews with stakeholders, and case studies.

The study sought to assess the relevance and comparative advantage, performance, results, and lessons learned through GEF support to the issues of climate change mitigation and climate change adaptation. The evaluation found that the GEF's climate change support has been, and continues

to be, highly relevant to convention guidance. The GEF's added value has especially been in policy and regulatory reform to support public and private climate investment, piloting technologies and business models to promote broader scale-up, strengthening public and private institutional capacity, and providing grant and concessional financing to lower the risks of project financing schemes and facilitate their implementation. Other evaluations have highlighted the complementarity of GEF support with other funds.

The findings of this evaluation were included in OPS6, which was presented to the GEF replenishment parties at their second meeting in October 2017. The full evaluation was presented to the GEF Council in November 2017.

Through this report, the GEF Independent Evaluation Office intends to share the lessons from the evaluation with a wider audience.



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Acknowledgments

The evaluation was led by Geeta Batra, Chief Evaluation Officer in the Global Environment Facility Independent Evaluation Office (GEF IEO). Core evaluation team members included consultants Mark Wagner and Jessica Kyle (ICF International). Sara El Choufi, Evaluation Analyst, IEO, provided research assistance.

The evaluation benefited from guidance and oversight provided by Juha Uitto, IEO Director. Administrative support was provided by Evelyn Chihuguyu, Program Assistant, and Marie-Constance Manuella Koukoui, Senior Executive Assistant. Mark Athitakis provided editorial

support, and Nita Congress designed and laid out the publication.

The GEF Secretariat and GEF staff involved in the projects included provided information, data, and insights during interviews and meetings. Country stakeholders provided additional information and insights through interviews.

The IEO is grateful to all these individuals and institutions for their contributions. Final responsibility for this report remains firmly with the Office.

Abbreviations

BUR	biennial update report	LDC	least developed country
CBIT	Capacity-Building Initiative for Transparency	LDCF	Least Developed Countries Fund
CCM	climate change mitigation	M&E	monitoring and evaluation
CIF	Climate Investment Funds	MSP	medium-size project
COP	conference of the parties	OPS	overall performance study
CTF	Clean Technology Fund	PIF	project identification form
DEDE	Department of Alternative Energy Development and Efficiency	PMIS	Project Management Information System
FSP	medium-size project	SCCF	Special Climate Change Fund
GCF	Green Climate Fund	SIDS	small island developing states
GEF	Global Environment Facility	UNDP	United Nations Development Programme
GHG	greenhouse gas	UNEP	United Nations Environment Programme
IDB	Inter-American Development Bank	UNFCCC	United Nations Framework Convention on Climate Change
IEO	Independent Evaluation Office	UNIDO	United Nations Industrial Development Organization
INDC	intended nationally determined contribution		

The GEF replenishment periods are as follows: pilot phase: 1991–94; GEF-1: 1995–98; GEF-2: 1999–2002; GEF-3: 2003–06; GEF-4: 2006–10; GEF-5: 2010–14; GEF-6: 2014–18; GEF-7: 2018–22.

All dollar amounts are U.S. dollars unless otherwise indicated.

Executive summary

This study provides the first comprehensive look at the relevance, results, effectiveness, and lessons learned of the Global Environment Facility's (GEF's) activities in the climate change focal area since 2004. The review was based on terminal evaluations of GEF-6 climate change mitigation (CCM) projects, field visits to Morocco and Thailand, and in-depth interviews with a broad range of stakeholders. The main conclusions follow.

- **GEF climate change support has been highly relevant to United Nations Framework Convention on Climate Change (UNFCCC) guidance and continues to be relevant in today's context.**

The GEF-6 Climate Change Focal Area Strategy is responsive to guidance from the convention, and the GEF-6 climate change portfolio is well aligned with convention guidance and the GEF CCM objectives. GEF climate adaptation activities—through the Least Developed Countries Fund and Special Climate Change Fund—are, for the most part, also highly relevant to UNFCCC guidance and decisions. The GEF has also been notably responsive to conference of the parties (COP) guidance issued after finalization of the GEF-6 strategy. In particular, the new Capacity-Building Initiative for Transparency Trust Fund was established just one year after the request from COP-21. The GEF's continuing relevance was further confirmed by the international community in late 2015, when the GEF, along with the Green Climate Fund, was

requested to serve as financial mechanism for the Paris Agreement.

- **The GEF climate change portfolio offers clear comparative advantages within the global climate finance landscape, but there is a need to further articulate and promote these.** The GEF's distinguishing features include its flexible grant financing; its focus on the enabling environment to support scaled-up climate investment; its emphasis on demonstrating technologies and financial approaches, including innovative and risk-sharing approaches; its ability to fund integrated projects across environmental issues; its experience; and its support to help countries meet their convention obligations. External analyses and key stakeholder interviews have identified potential niches for the GEF in focusing on upstream activities to develop supportive conditions for broader climate investment (e.g., through policy work and capacity building), as well as piloting innovative and riskier approaches—which, if successful, could be taken up by other funds such as the Green Climate Fund.
- **Most GEF climate change projects have shown some evidence of catalytic effects.** The most common catalytic effect was mainstreaming (primarily through policy or regulatory reform), and the least common was scaling up. About 70 percent of closed projects analyzed showed evidence of progress toward impact through

mainstreaming. Such mainstreaming takes place when information, lessons, or specific results of GEF interventions are incorporated into broader stakeholder mandates and initiatives such as laws, policies, regulations, or programs. Performance was less strong (about a third of the projects) for replication, scaling up, and market changes. Broader sector and economic issues—such as energy subsidies—have been constraints to the broader adoption of the approaches demonstrated by GEF activities. Projects demonstrating a high level of progress toward impact are those that have adopted comprehensive approaches to address market barriers and specifically targeted supportive policy frameworks, and have frequently secured follow-on funding from the GEF or other multilateral or bilateral donors. Least Developed Countries Fund and Special Climate Change Fund projects had similar results and were found to be catalytic in generating social, economic, cultural, and human well-being co-benefits.

- **The GEF has an important role to play in strengthening the enabling environment for scaling up public, and especially private, climate investment.** Significant impact can be leveraged through capacity-building and policy activities, as a recent impact evaluation of GEF CCM support in China, India, Mexico, and the Russian Federation found. GEF support has been limited but critical for development of energy policies and laws in some countries, primarily in the areas of energy efficiency (e.g., certification, standards, and labeling) and renewable energy (e.g., feed-in-tariffs). The GEF's impact on policy and regulatory reform has been most visible in countries with high levels of ownership among government and other stakeholders.

- **The majority of GEF projects show evidence at project closure of outcomes that should lead to greenhouse gas (GHG) emissions reductions.**

However, a significant proportion of projects either fall short of their emissions target or estimate at closure that no emissions reductions will be achieved. The terminal evaluation review found that 20 of 52 projects exceeded their direct GHG emissions reduction targets, 12 fell short, and another 20 did not have information available to evaluate their achievement against targets. A sizable number of GEF projects may not be achieving their expected emissions reductions. In addition, missing and inconsistently reported information is a limiting factor in analyzing performance against targets. To date, the GEF has not systematically tracked or reported estimated emissions reductions achieved at the time of project closure.

- **Activities funded by other focal areas and initiatives, along with multifocal area projects, are poised to deliver significant global environmental benefits (GHG emissions reductions) that may be greater than those achieved by activities financed by the climate change focal area alone.** Stand-alone projects in the climate change focal area are only a third of the total expected GHG emissions reductions from the GEF-6 portfolio. Significant contributions are also expected from sustainable forest management and other focal areas, as well as the integrated approach pilots, pushing anticipated GHG emissions reductions well above the target for GEF-6. Climate change priorities have also increasingly been addressed through multifocal area projects. Over time, the GEF CCM portfolio has shifted toward more multifaceted projects with holistic approaches, and more than 40 percent of approved projects in GEF-6 seek to enhance synergies across focal

areas, mostly through integrated urban management and mitigation-adaptation activities.

The main recommendations of this study are as follows:

- **The GEF should place continued emphasis on its work on the enabling environment, and innovative projects in climate change mitigation to support market transformation.**

The GEF should continue to focus on piloting and demonstrating technologies and financial approaches that could be scaled up by other actors. The GEF should explore its potential to be an incubator for countries to test and refine their approaches prior to seeking large-scale finance through other partners. These are areas where the GEF has shown strong results and a comparative advantage. The GEF should also continue to emphasize innovative and

cutting-edge projects in its Least Developed Countries Fund and Special Climate Change Fund portfolios, to advance climate change adaptation knowledge and practice.

- **The GEF Secretariat should take measures to ensure reporting against global environmental benefits targets.** To understand what past results have been achieved, the GEF Secretariat and the GEF Agencies should ensure postcompletion reporting against global environmental benefits targets, specifically GHG emissions mitigated.

1: Introduction

1.1 Background

The Global Environment Facility (GEF) climate change focal area is one of the six focal areas supported by the GEF Trust Fund and focuses on mitigation strategies to reduce greenhouse gas (GHG) emissions as well as support for country obligations to the United Nations Framework Convention on Climate Change (UNFCCC) for reporting and assessments. The GEF also administers the Least Developed Countries Fund (LDCF), which is mandated to provide support to the climate change adaptation efforts of least developed countries (LDCs), and the Special Climate Change Fund (SCCF), which has a broad scope covering climate change adaptation and mitigation for parties not included in Annex I of the UNFCCC. The GEF's climate change focal area, LDCF, and SCCF are all financial mechanisms of the UNFCCC, for which the GEF acts as the operating entity.

The long-term goal of the climate change focal area strategy, as formulated in the GEF-6 Programming Directions, is to support developing countries and economies in transition to make transformational shifts toward a low-emissions development path. GEF support also aims to enable recipient countries to prepare for the Green Climate Fund (GCF), the new climate financing instrument under the UNFCCC that is applicable to all parties. The goal of the GEF Adaptation Program, through the LDCF and SCCF, is to increase resilience to the adverse impacts of climate

change in vulnerable developing countries, through both near- and long-term adaptation measures in affected sectors, areas, and communities, leading to a reduction of expected socioeconomic losses associated with climate change and variability.

Over time, the GEF has approved more than 1,000 projects and \$3.6 billion under its climate change focal area and more than 340 projects and \$1.5 billion under the LDCF and the SCCF. For GEF-6, the aim has been to allocate \$1.26 billion to climate change mitigation (CCM) projects and programs, down from \$1.36 billion under GEF-5. No GEF-6 financial targets were set for the climate change adaptation component, given the voluntary nature of the replenishment process of the two adaptation-focused funds, the LDCF and the SCCF.

1.2 Objectives

The main purpose of this study is to provide insight and lessons for the GEF's climate change support by assessing the relevance, results, effectiveness, and lessons learned through GEF support to the issues of climate change mitigation and adaptation. The findings of this study and other complementary GEF Independent Evaluation Office (IEO) evaluations will feed into the Sixth Comprehensive Evaluation of the GEF (OPS6). This report specifically provides the following:

- An analysis of the relevance of GEF climate change strategies and investments in the light of guidance and decisions from the UNFCCC
- An assessment of the GEF's comparative advantages as a climate change finance mechanism, within the changing climate finance landscape
- A synthesis of climate change results and effectiveness in progress toward impact
- An assessment of the approaches and mechanisms through which results have been achieved
- An assessment of challenges that have been faced in taking programs to scale
- Identification of lessons learned, informing opportunities for GEF-7
- GEF strategy papers, such as the focal area strategies for previous GEF replenishment periods and the programming directions for GEF-6
- Previous GEF evaluations that contained analysis of the GEF's climate change focal area
- Recent GEF IEO evaluations of the LDCF and SCCF
- GEF project documents, including terminal evaluations and GEF-6 project documents

UNFCCC guidance and decisions, as well as reviews of the GEF conducted by the UNFCCC and GEF Agencies, were also reviewed. External secondary literature, including reports on the climate finance landscape by the World Resources Institute and Climate Policy Initiative, were also considered.

Because the GEF IEO has recently evaluated the LDCF and SCCF, this study focuses its assessment primarily on the GEF's climate change mitigation focal area and draws on evidence from the recent LDCF and SCCF evaluations (GEF IEO 2016, 2018c) to provide a synthesis of GEF support for adaptation.

1.3 Methodology

The study used a mixed-methods approach based on both quantitative and qualitative analytical methods, including desk research, portfolio analysis (including quality at entry review and review of completed projects), fieldwork and case studies, and interviews.

DESK RESEARCH

The study reviewed a wide range of relevant GEF documents, including

- GEF Council documents

PORTFOLIO ANALYSIS

An analysis of trends in the GEF portfolio was based on project data from the GEF's Project Management Information System (PMIS) as of June 19, 2017. An analysis of project performance in the GEF climate change focal area was based on the GEF IEO's internal terminal evaluation data set for the 2016 Annual Performance Report, which contains projects' outcome, sustainability, and other ratings for projects with terminal evaluations.

An in-depth desk review was conducted for all ($n = 52$) GEF-3 and GEF-4 CCM projects completed after 2012 for which terminal evaluations were available.¹ A project review instrument was designed to assess the project approaches,

¹ From the full set of GEF climate change projects with terminal evaluations ($n = 307$), the analysis excluded projects completed in 2012 and earlier, projects from GEF-2 and earlier, projects financed by trust funds other than the GEF Trust Fund, projects under the Strategic Priority on Adaptation projects, and projects focused on

progress toward impact, and GHG emissions reduction impact of these projects, and was systematically applied across all 52 projects. A full list of the projects included in this analysis is presented in [table A.1](#) in annex A.

Another in-depth desk review was conducted of GEF-6 CCM projects ($n = 61$).² The review looked at coherence between the GEF-6 Programming Directions, guidance and decisions from the UNFCCC Conference of the Parties (COP), and the 61 projects, which received at least project identification form (PIF) approval during GEF-6. A full list of the projects included in this analysis is presented in [table A.2](#) in annex A.

FIELDWORK AND CASE STUDIES

Two countries—Morocco and Thailand—were chosen for in-depth desk review and field studies, based on selection criteria designed to maximize coverage across project focuses, while also ensuring inclusion of countries representing the variety of GEF experiences (e.g., in different geographical regions, both medium-size projects [MSPs] and full-size projects [FSPs], and different Agencies). [Tables A.3](#) and [A.4](#) in annex A list the projects reviewed in those countries. A list of the country stakeholders interviewed is presented in [annex B](#).

In addition to these field studies, a sample of 21 projects with available terminal evaluations were reviewed in more depth to assess project approaches, mechanisms for broader adoption,

national communications. Of the remaining 56 projects, terminal evaluations were not available for 4.

²This review included all projects in the PMIS as of the January 2017 cut-off date to conduct this specific review. While more projects were or could have been in the system, only 61 projects were advanced enough in their review and/or approval process such that their funding was included in the PMIS.

and lessons learned. Projects were selected for representation across mitigation technology/sector (renewable energy, energy efficiency, and sustainable transportation), variety of project approaches within the mitigation technology (based on data provided by the GEF Secretariat), geographical regions, and Agencies.³ A list of these case study projects is presented in [table A.5](#) in annex A.

INTERVIEWS

In-depth interviews were conducted with 23 key stakeholders from the GEF Secretariat, GEF Agencies, UNFCCC, the GCF, and the Climate Investment Funds (CIF). Agencies interviewed were the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO), European Bank for Reconstruction and Development, Development Bank of South Africa, Conservation International, Inter-American Development Bank (IDB), and the World Bank. Government counterparts, Agency project staff, private sector stakeholders, and other project beneficiaries were also interviewed during fieldwork in Morocco and Thailand, as noted above. A full list of interviewees is provided in [annex B](#).

1.4 Evolution of the climate change focal area strategies

MITIGATION

The GEF's strategies for its climate change mitigation programming have evolved and matured over time. The GEF Operational Strategy (1995)

³The selected projects are primarily a subset of the terminal evaluation review sample mentioned previously ($n = 52$). A few additional projects were selected to ensure coverage across the criteria mentioned above.

and Operational Programs (developed from 1996 to 2000) that served as the basis for programming for GEF-1 and GEF-2 emphasized removing barriers to broader adoption of energy efficiency and renewable energy technologies. The GEF-3 Strategic Priorities began to shift the GEF's focus toward creating conducive policy and market environments for technology diffusion.

The emphasis on market transformation and market-based approaches continued into the GEF-4 Strategic Programs. Additionally, the GEF-4 focal area strategy included new programs for promoting sustainable energy production from biomass and the management of land use, land use change, and forestry, and moved away from GEF support for off-grid renewable energy and low-GHG emitting energy technologies, noting that past projects in these areas had achieved less-than-desired results. Later during GEF-4, in response to a COP-14 decision on the development and transfer of technology, the GEF launched the Poznan Strategic Program on Technology Transfer that involved support for technology needs assessments and financing priority pilot projects on the transfer of environmentally sound technologies.

In GEF-5, the climate change focal area strategy retained the focus on market transformation, but also expanded beyond the creation of the enabling environment for such transformation to promoting investment, particularly for renewable energy modalities. The GEF-5 climate change objectives also renewed support for off-grid renewable energy projects, expanded the scope of its urban transport support to include integrated approaches to promote low-carbon cities, and expanded the land use, land use change, and forestry program. The GEF-5 strategy also began to identify support specifically for small island developing states (SIDS) and LDCs, and for the GEF's strategic role in the emerging carbon market.

Support for innovation and technology transfer also continued under GEF-5.

The GEF-6 climate change focal area strategy addresses many of the same core areas as GEF-5, but in a different configuration that focuses more on the GEF's models of influence, rather than sectors or technologies (e.g., energy efficiency, renewable energy, sustainable transport, and land use, land use change, and forestry). The GEF-6 strategy focuses on three objectives: promoting innovation, technology transfer, and supportive policies and strategies (CC1), demonstrating systemic impacts of mitigation options (CC2), and fostering enabling conditions to mainstream mitigation concerns into sustainable development strategies (CC3). Funds are also set aside for UNFCCC obligations and enabling activities. The GEF-6 strategy also features a stronger emphasis on integrated approaches, innovative measures (such as performance-based incentives), and links and complementarity with other initiatives and climate funds. In addition, two of three integrated approach pilot programs included in the GEF-6 Programming Directions involve the climate change focal area: Sustainable Cities, and Sustainability and Resilience for Food Security in Sub-Saharan Africa.

ADAPTATION

The GEF has supported climate change adaptation programming through several avenues, including the LDCF, SCCF, and the Strategic Priority on Adaptation, which was launched in 2005 as a \$50 million allocation within the GEF Trust Fund and is now closed. The LDCF was established in response to guidance from COP-7 in 2001 and is mandated by the parties to the UNFCCC to provide support to LDCs' climate change adaptation efforts, including the preparation of national adaptation programs of action (NAPAs), the implementation of NAPA priority projects in LDCs, and

the preparation of the national adaptation plan process in eligible developing countries. The SCCF finances adaptation to climate change in all eligible developing country parties to the UNFCCC, including non-LDCs.

The GEF-5 strategy for adaptation (LDCF and SCCF) was organized around three strategic objectives: reducing vulnerability (CCA-1); increasing adaptive capacity (CCA-2); and adaptation technology transfer (CCA-3). In GEF-6, the strategy evolved in recognition of the comparative strengths of the GEF and project successes to date. Mainstreaming adaptation into broader development frameworks was further emphasized; in the GEF-5 strategy it was an outcome under CCA-1, while in GEF-6 it is a strategic

objective in its own right (integrating CCA into relevant policies, plans and associated processes). Technology transfer—previously a stand-alone strategic objective in GEF-5—was identified as a cross-cutting theme in GEF-6. The GEF-6 programming strategy for adaptation also layered in the concept of two strategic pillars, in addition to three strategic objectives. These pillars are: integrating climate change adaptation into relevant policies, plans, programs, and decision-making processes; and expanding synergies with other GEF focal areas. This second pillar reflects a similar evolution as the mitigation strategy toward more integrated approaches.

2: Analysis of the GEF climate change portfolio

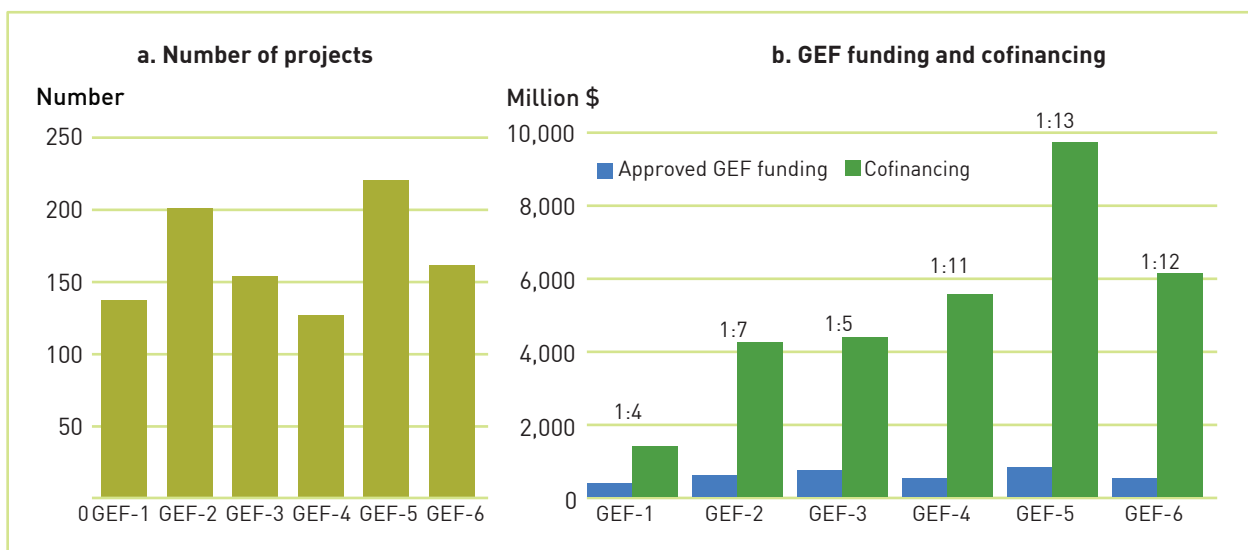
From its inception through GEF-6, the GEF has approved \$3.6 billion in grant funding for 1,037 CCM projects, with an additional \$33.4 billion mobilized in cofinancing.¹ The climate change focal area also includes 21 programs amounting

to \$633 million and encompassing 160 child projects.² GEF funding for CCM projects has grown significantly since GEF-1 (figure 2.1). The ratio of cofinancing to GEF funding—i.e., the total amount of non-GEF resources provided for a project compared to GEF grant resources—has also steadily increased over the GEF replenishment periods.

¹Based on data in the GEF PMIS as of June 19, 2017. The analysis includes all projects that have received at least PIF approval or are further along in the project cycle. The analysis excludes canceled projects; parent programs and child projects; multifocal area projects with climate change components; and LDCF, SCCF, and multitrust fund projects. Funding and cofinancing levels are those amounts indicated at project approval or endorsement.

²Programs are not included in the remainder of this portfolio analysis. A separate evaluation of programmatic approaches by the GEF IEO focuses on the GEF's experience with the program modality (GEF IEO 2018a).

FIGURE 2.1 Number of projects, and GEF funding and cofinancing for CCM, by GEF replenishment period



SOURCE: GEF PMIS.

NOTE: Does not include projects and resources approved under the LDCF and the SCCF. Cofinancing ratios shown in b.

GEF’s LDCF and SCCF portfolios are composed of 340 projects that have received \$1.5 billion in grant funding with an additional \$7.7 billion mobilized in cofinancing. The LDCF and SCCF portfolios additionally include two programs amounting to \$46 million in grant funding and encompassing eight child projects.³ The analysis in the remainder of this chapter does not include the GEF’s LDCF and SCCF portfolios; for a complete analysis of those portfolios, see the recent independent evaluations of the LDCF and SCCF released by the GEF IEO (GEF IEO 2016, 2018c).

2.1 Project modality

By number of projects, FSPs represent the majority of GEF CCM projects (46 percent), followed by enabling activities (32 percent) and MSPs (22 percent). By funding, FSPs have dominated, accounting for 86 percent of GEF funding to CCM

projects. Figure 2.2 shows the evolving number of projects and approved resources by modality during each GEF replenishment period.

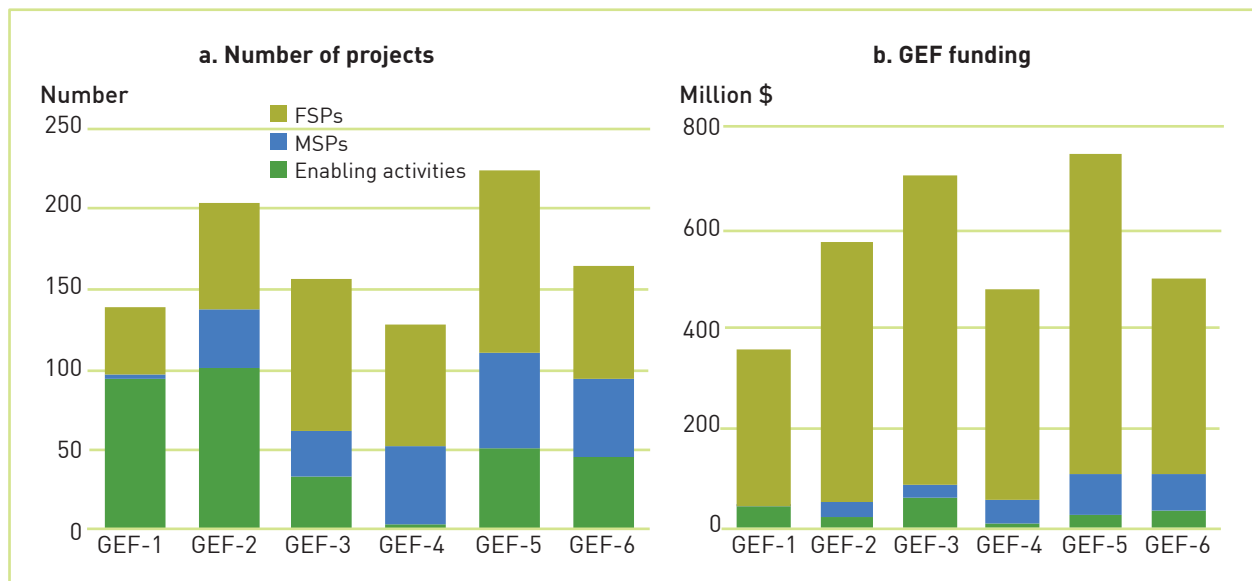
In GEF-1 and GEF-2, significant numbers of enabling activities were undertaken to support developing countries in meeting their UNFCCC obligations through the preparation of national communications, as well as capacity building in priority areas. In GEF-3, the portfolio began to shift toward implementation of FSPs and MSPs, with enabling activities sharply declining in GEF-4 (only 3 out of 126 projects) but picking back up again in GEF-5 and GEF-6, largely to support the preparation of national communications and biennial update reports (BURs), as well as intended nationally determined contributions (INDCs) in mid-GEF-6.

2.2 GEF Agency

The GEF climate change focal area is composed of 18 partner Agencies that have been accredited

³Based on data in the GEF PMIS as of June 19, 2017.

FIGURE 2.2 Number of projects and approved resources by modality and GEF replenishment period



SOURCE: GEF PMIS.

to implement GEF activities: 3 original Agencies (UNDP, UNEP, and the World Bank), 7 Agencies from the first round of the GEF partnership's expansion (the Asian Development Bank, the African Development Bank, the European Bank for Reconstruction and Development, the Food and Agriculture Organization of the United Nations, IDB, the International Fund for Agricultural Development, and UNIDO), and 8 Agencies from the second round of the GEF partnership's expansion (Conservation International, the Development Bank of Latin America, the Development Bank of South Africa, the Foreign Economic Cooperation Office, Ministry of Environmental Protection of China [FECO], the Brazilian Biodiversity Fund [FUNBIO], the International Union for Conservation of Nature, the West African Development Bank, and the World Wildlife Fund).⁴ Agencies from the first round of the GEF partnership expansion—UNIDO, IDB, the African Development Bank, and the International Fund for Agricultural Development—began to gain portfolio share in GEF-4. Of the eight Agencies from the second round of expansion, three—Conservation International, the Development Bank of South Africa, and the West African Development Bank—began implementing CCM projects in GEF-5 and GEF-6. So far in GEF-6, Agencies that were added during the first and second rounds of expansion account for 30 percent of projects and 36 percent of approved CCM resources.⁵ Figure 2.3 shows the number of projects and approved resources by Agency during each GEF replenishment period.

⁴ Agency terms and descriptions used in this study are consistent with the definitions provided in Accreditation Procedure for GEF Project Agencies (Annex 1, GEF/C.39/8/Rev.2), as well as the May 2016 Evaluation of the Expansion of the GEF Partnership First Phase.

⁵ The first round of expansion took place between 1999 and 2006; the second round of expansion took place between 2013 and 2015.

While Agencies that were added during the first and second rounds of expansion have been gaining portfolio share, the three original Agencies are still the largest shareholders of GEF projects and resources. In total, by number of projects, UNDP has implemented the largest share of projects (56 percent), followed by the World Bank with 15 percent and UNEP with 8 percent. By funding, the World Bank has received the largest share of approved GEF resources (39 percent)—attributed to the dominance of FSPs in their portfolio (78 percent of projects and 97 percent of approved resources)—followed by UNDP with 31 percent of approved resources.

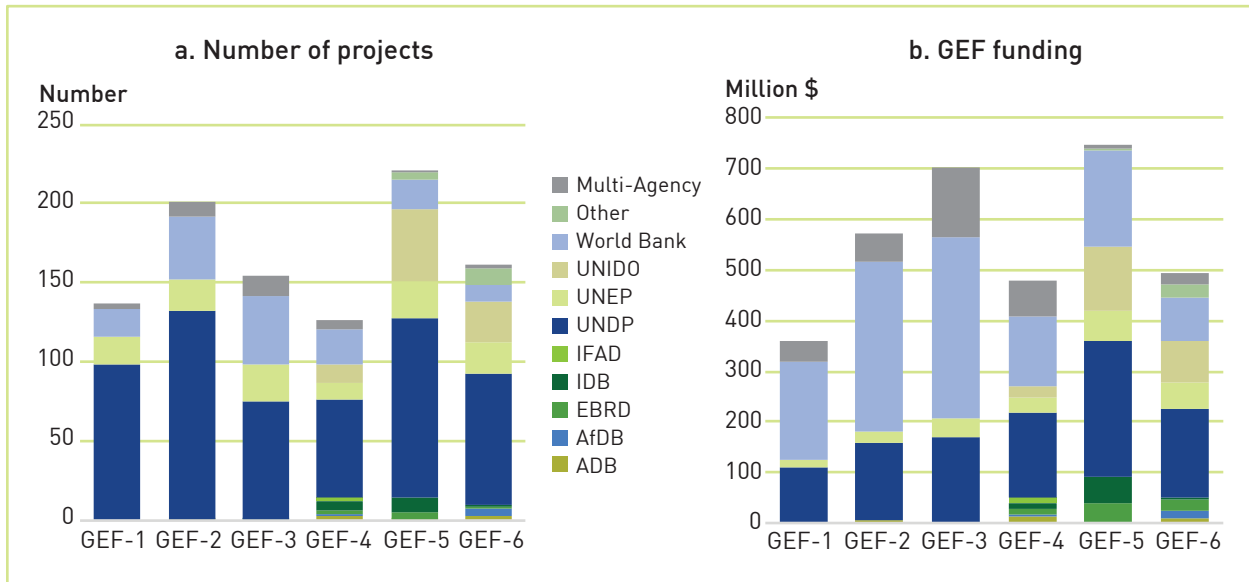
Thus far into GEF-6, the share of projects by original Agencies has remained at GEF-5 levels (about 70 percent) while their share of resources has decreased slightly (from 69 percent in GEF-5 to 64 percent). The World Bank in particular has had a sharp decline in share of projects and resources since GEF-3—a trend that continues into GEF-6. Between GEF-3 and GEF-4, the World Bank's share dropped from more than half of approved CCM resources to one quarter. Three-quarters of the way through GEF-6, the World Bank accounts for only 7 percent of projects and 17 percent of resources.

2.3 Mitigation technology/sector

The GEF CCM mitigation portfolio has been dominated by renewable energy and energy efficiency projects (36 percent and 27 percent of projects, respectively) from GEF-1 through GEF-6.⁶ Renewable energy project types include mixed renewables (40 percent), bioenergy (19 percent), solar (22 percent), hydropower (9 percent), wind (6 percent), and geothermal (4 percent). Figure 2.4

⁶ Analysis excludes enabling activities, multifocal area and multitrust fund projects, and projects funded through the SCCF and LDCF trust funds.

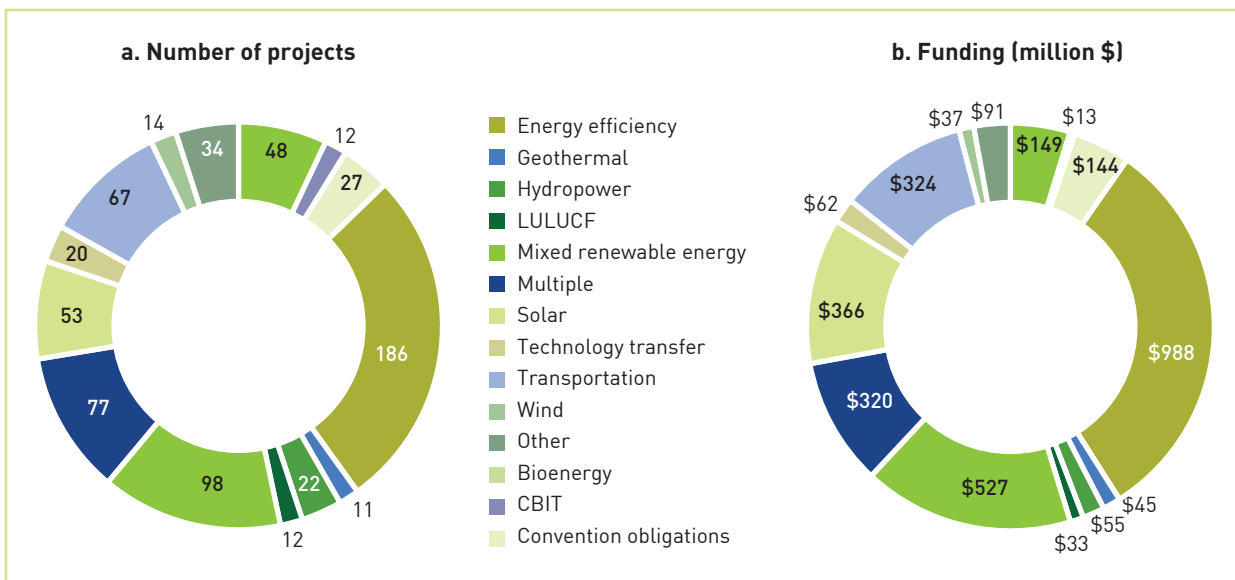
FIGURE 2.3 Number of projects and approved resources by Agency and GEF replenishment period



SOURCE: GEF PMIS.

NOTE: ADB = Asian Development Bank; AfDB = African Development Bank; EBRD = European Bank for Reconstruction and Development; IDB = Inter-American Development Bank; IFAD = International Fund for Agricultural Development; UNIDO = United Nations Industrial Development Organization. Other includes the West African Development Bank, Development Bank of Latin America, Conservation International, Development Bank of South Africa, the Food and Agriculture Organization of the United Nations, the GEF Secretariat, and the International Union for Conservation of Nature.

FIGURE 2.4 Total number of GEF CCM projects and GEF funding by technology/sector



SOURCE: GEF PMIS.

NOTE: LULUCF = land use, land use change, and forestry

shows the distribution of GEF CCM projects and funding by technology/sector. Transportation and wind projects generated the highest cofinancing ratios (1:14 and 1:13, respectively).

2.4 Region

Asia, with 39 percent of approved GEF resources, accounts for the largest share of funding by region. The Latin America and Caribbean region accounts for the second largest share of funding by region (19 percent), followed by Africa (17 percent), and Eastern Europe and Central Asia (14 percent). Global projects account for 11 percent of approved resources. Figure 2.5 shows the number of projects and approved resources by region during each GEF replenishment period.

Brazil, the Russian Federation, India, China, and South Africa—i.e., the BRICS countries—have together accounted for more than 40 percent of

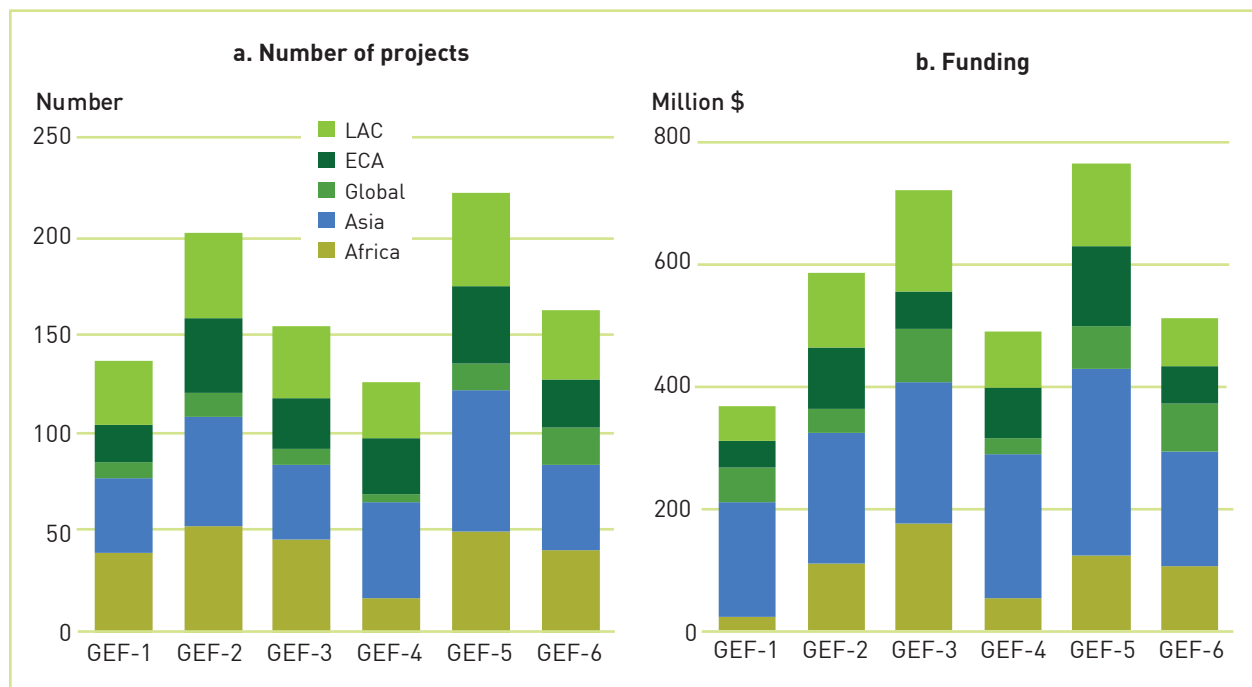
GEF CCM resources over time (figure 2.6). China alone has received 21 percent of CCM funding from GEF-1 through GEF-6 for single-country projects (6 percent of projects). Nearly all of these projects are FSPs that span across a range of mitigation technologies, including renewable energy, biomass, energy efficiency, and transport.

2.5 Country conditions

LDCs account for nearly 20 percent of single-country CCM projects approved since GEF-1.⁷ Of these projects, almost half have been in Africa. GEF support for LDCs in the CCM portfolio has grown steadily over time, from 4 percent of approved resources in GEF-4 to 9 percent in GEF-5 and 14 percent thus far in GEF-6. UNDP is the

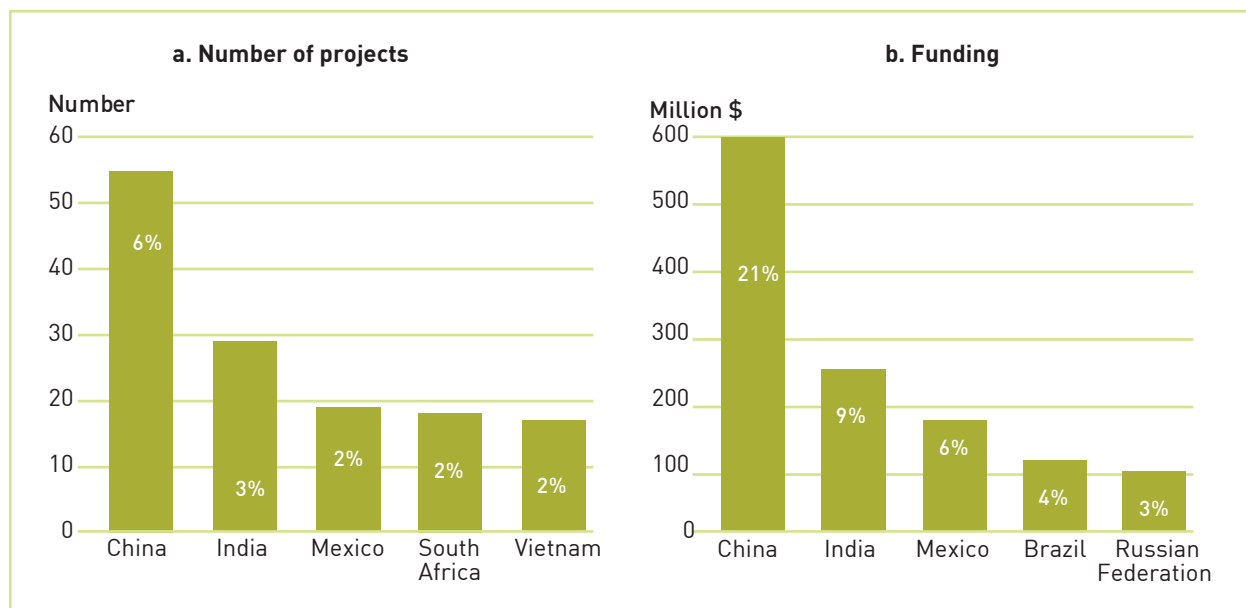
⁷Analysis of CCM portfolio excludes LDCF and SCCF projects, as well as multifocal area and multitrust fund projects.

FIGURE 2.5 Number of projects and approved resources by region and GEF replenishment period



SOURCE: GEF PMIS.

FIGURE 2.6 Top five countries by number of projects and GEF CCM funding



SOURCE: GEF PMIS.

NOTE: Percentages represent number of projects/approved resources as a percentage of single-country projects/resources approved from GEF-1 through GEF-6.

Agency with the highest share of single-country projects in LDCs (55 percent), followed by the World Bank with 14 percent.

Projects implemented in SIDS account for 11 percent of single-country CCM projects approved since GEF-1. The majority of these projects have been in the Latin America and Caribbean region. GEF support for SIDS has grown from 2 percent of approved CCM resources in GEF-4 to 5 percent in GEF-5 and 13 percent thus far in GEF-6. UNDP has had the highest share of single country projects in SIDS (69 percent), followed by UNEP with 13 percent.

Approximately half of the single-country projects in LDCs and SIDS are enabling activities. These have included assistance with UNFCCC obligations, including the preparation of BURs, national communications, INDCs, national GHG inventories, and capacity building. The other half of single-country projects are MSPs and FSPs

covering a range of technologies and sectors, including renewable energy, energy efficiency, transportation, and bioenergy.

Multicountry CCM projects have also included support for LDCs and SIDS. Approximately 39 percent of multicountry projects have included support for at least one LDC or SIDS country. The Africa region has the highest concentration of multicountry projects supporting LDCs and SIDS, followed closely by Asia and the Latin America and Caribbean region.

2.6 Multifocal area projects

Since GEF-1, 129 multifocal area projects with CCM components have been approved; nearly 80 percent of those projects were approved in GEF-5 and GEF-6. Nine multifocal area projects have been completed, with the remainder under approval or implementation. The proportion of CCM resources in multifocal area projects

represents 19 percent of total approved resources from GEF-1 through June 2017. This proportion has grown over time, from 8 percent in GEF-4, up to 35 percent in GEF-5, and 42 percent thus far in GEF-6. Multifocal area projects represent 11 percent of the total number of approved projects in the CCM portfolio.

The climate change focal area has collaborated most frequently with the biodiversity focal area, followed by the land degradation focal area; approved projects have mainly focused on biodiversity conservation, sustainable land management, and land use, land use change, and forestry. The GEF-6 CC-2 objective (demonstrate systematic impacts of mitigation options) is directly relevant to multifocal programming with Program 4 of the land degradation focal area (promote conservation and enhancement of carbon stocks in forest, and other land use, and support climate smart agriculture).

Multifocal area projects—including those without funding from the climate change focal area—appear poised to make significant indirect contributions to climate change global environmental benefits, in particular mitigation of GHG emissions through increased adoption of innovative technologies and management practices for GHG emissions reduction and carbon sequestration, and through conservation and enhanced carbon stocks in agriculture, forest, and other land use. Eighty-seven percent of multifocal area projects that did not receive climate change funding tracked climate change-related indicators (GEF IEO 2017b).

2.7 Multitrust fund projects

Fourteen multitrust fund projects—nine of which are multifocal area—have been approved since GEF-1, representing approximately 3 percent of total approved resources for CCM projects.

Thirteen of these projects were approved in GEF-5 and one was approved in GEF-6. These projects have leveraged an average cofinancing ratio of 1:6. The five multitrust fund projects that are not multifocal area largely relate to technology transfer, a key element of the GEF's support to the UNFCCC Technology Mechanism that was established in 2010.

2.8 System for Transparent Allocation of Resources

System for Transparent Allocation of Resources (STAR) allocation targets across the climate change focal area decreased from \$1.088 billion in GEF-5 to \$941 million in GEF-6.⁸ The 52nd GEF Council meeting requested a further reduction of the GEF-6 target to \$760 million based on the projected shortfall in the availability of funds. As of March 2017, 53 percent of the original target had been utilized and 66 percent of the revised target had been utilized (GEF 2017). Several Agencies interviewed mentioned the STAR allocation model and lower funding volumes available for climate change work on an individual country basis as challenges, suggesting that this fragmentation has been a limiting factor for the types of projects the GEF can pursue in some countries.

2.9 Cofinancing

Cofinancing ratios have steadily increased for climate change mitigation activities over time, going from 1:4 in GEF-1 to 1:13 in GEF-5 and 1:12 so far in GEF-6 (see [figure 2.1](#)). On average, regional and national projects have leveraged the most cofinancing per dollar of GEF grant, with ratios of 1:11 and 1:10, respectively. Global projects have leveraged much less over time, with a ratio of 1:2.

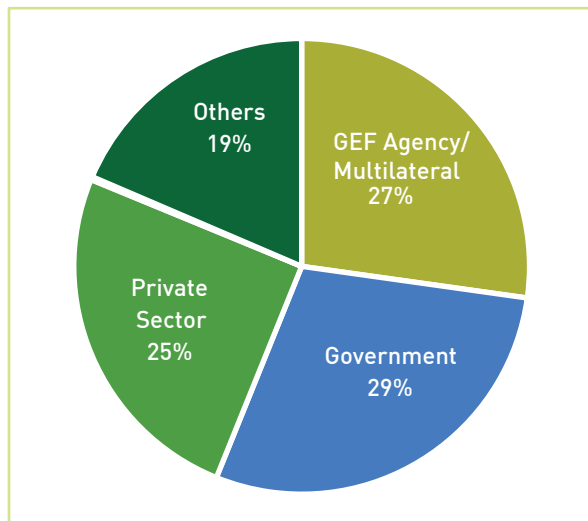
⁸Allocation amounts exclude focal area set asides.

As shown in figure 2.7, government agencies are the largest source of expected cofinancing for CCM projects, followed by GEF Agencies. Development banks (i.e., the Asian Development Bank, the African Development Bank, West African Development Bank, Development Bank of Latin America, Development Bank of South Africa, the European Bank for Reconstruction and Development, IDB, and the World Bank) have leveraged more cofinancing on average than other Agency types. This is particularly evident in GEF-4 through GEF-6, where development banks had cofinancing ratios between 1:19 and 1:23, while other Agencies had cofinancing ratios between 1:7 and 1:9. GEF Agencies that were added during the first and second rounds of expansion have been gaining share of the total cofinancing generated by CCM projects over time, going from 3 percent of total cofinancing in GEF-3 to 20 percent of cofinancing in GEF-5. So far in GEF-6, Agencies that were added during the first and second rounds of expansion account for 46 percent of cofinancing and have surpassed the original Agencies with a cofinancing ratio of 1:15 (compared to 1:11).

Approximately 93 percent of cofinancing went to CCM projects in middle-income countries (30 percent to lower middle income and 63 percent to upper middle income).⁹ Cofinancing contributions

⁹Based on World Bank country classifications by income according to 2015 gross national income (GNI) per capita.

FIGURE 2.7 Share of expected cofinancing by entity type



SOURCE: GEF PMIS.

by GEF Agencies and country governments were higher than the private sector across all country income classifications except for high income, where the private sector contributed more than twice as much cofinancing than GEF Agencies but still less than country governments. This reflects the relative maturity and higher capacity of the private sector in high-income countries.

3: Meta-evaluation review

This chapter summarizes the major findings and conclusions of previous assessments by the GEF IEO and other key actors. The review focuses on evidence-based conclusions reached by earlier evaluations regarding relevance to the UNFCCC, results, and effectiveness. These evaluations include the Fourth and Fifth Overall Performance Studies (OPS4 and OPS5—GEF IEO 2010, 2014c); the Evaluation of GEF Focal Area Strategies (GEF IEO 2013); and an impact evaluation of climate change mitigation in China, India, Mexico, and Russia (GEF IEO 2014a). The UNFCCC’s Standing Committee on Finance (2014) also recently conducted the Fifth Review of the Financial Mechanism to the UNFCCC, including the GEF. The LDCF and the SCCF have recently undergone independent program evaluation (GEF IEO 2016, 2018c); these evaluations are discussed in chapter 6 on results and effectiveness of GEF support for climate change adaptation.

3.1 OPS4

OPS4 (GEF IEO 2010) was the first of the overall performance studies to address the impact of completed GEF projects. In the climate change focal area, GEF funding was found to have enabled achievement of progress toward intended global environmental benefits in terms of GHG emissions reduction and avoidance, as well as in terms of sustainable market changes. Approximately 38 percent of projects analyzed had made strong progress toward global environmental benefits. In

addition, actual cost-effectiveness of the projects had been greater than planned. The evaluation noted, however, that unless the GEF-5 replenishment offered a substantial increase over GEF-4, the GEF would need to prioritize which programs to support to continue to achieve progress toward impact.

OPS4 also emphasized the significance of stakeholder involvement throughout the design and implementation of GEF climate change projects. Specifically, the evaluation noted that projects showed a higher level of progress toward intended global environmental benefits when they catalyzed government commitment at all levels; incorporated coherent financial, policy, and economic market incentives; obtained resources necessary to scale up project benefits; and generated and encouraged lasting commitment of key national stakeholders. Based on these conclusions, OPS4 recommended the further development of programming at the national level, including through national committees and national business plans.

3.2 Evaluation of GEF Focal Area Strategies

This evaluation (GEF IEO 2013) aimed to gain a deeper understanding of the elements and mechanisms that make a focal area strategy successful. Technical Paper 2 of the evaluation (GEF IEO 2012a) focused on the climate change focal area, while Technical Paper 7 focused on the LDCF and SCCF

(GEF IEO 2012b). Both papers made the causal links between GEF activities and the chains of causality toward the achievement of expected results more explicit. The technical papers also reviewed guidance from the UNFCCC against the GEF-5 Focal Area Strategy for climate change and the LDCF/SCCF Strategy; both strategies were found to largely reflect the guidance of the UNFCCC.

3.3 OPS5

OPS5 (GEF IEO 2014c) introduced a general framework for a GEF-wide theory of change, based on the foundational work done in the Evaluation of the GEF Focal Area Strategies (GEF IEO 2013). An analysis of progress toward impact (informed by the new theory of change) in 113 completed climate change projects confirmed the success of the focal area's intervention logic. Nearly 80 percent showed evidence of reducing GHG emissions, and 66 percent of projects reported successful broader adoption, the majority through mainstreaming measures. Policy, legislative, and regulatory projects were the most likely to be mainstreamed, but some financing as well as energy efficiency and renewable energy projects were also successfully mainstreamed, though the financing projects faced significant challenges. Replication was found to be the second most common mechanism of broader adoption in the climate change portfolio. Technological or infrastructure projects were the most commonly replicated, especially those that were relevant, applicable, feasible, cost-effective, and profitable to stakeholders. These projects were also the most likely to experience scaling-up or result in market change, though these results were less common.

OPS5 Technical Document #20, "GEF Climate Change Mitigation GHG Analysis" (GEF IEO 2014b) offered a supporting analysis of the climate change focal area's GHG emissions reductions.

For completed projects with revised estimates for direct mitigation, 56 percent were expected to meet or exceed their original mitigation targets, resulting in larger portfolio-level emissions reductions than originally targeted. Thus, from a portfolio perspective, GEF projects were found to be successful in terms of achieving their emissions reduction. However, a relatively small number of projects were responsible for the increase in overall expected mitigation.

OPS5 also synthesized conclusions and evaluative evidence on adaptation to climate change. It noted that adaptation has been included in the GEF IEO's evaluation streams such as country-level evaluations and performance evaluations. Adaptation is also included through work on focal area strategies, results-based management and tracking tools, multifocal area and multitrust fund projects, and gender mainstreaming.

3.4 Impact Evaluation on Climate Change Mitigation

This impact evaluation (GEF IEO 2014a) assessed 18 projects in four countries to determine the progress toward impact of GEF's climate change mitigation focal area. It found that in total, the projects exceeded their combined GHG emissions reduction target by 39 percent. In addition, 16 of 18 projects analyzed resulted in significant direct GHG emissions reductions; indirect GHG emissions reductions, though not verified, were estimated to be greater than direct emissions reductions. In 15 of 18 projects, GEF had achieved its goal of broadening impacts through sustaining the outcomes and benefits of investments; mainstreaming information, lessons, and results of the projects; replicating projects in new regions; scaling projects beyond their initial dimensions; and changing and transforming markets. The evaluation also showed that projects with comprehensive approaches to addressing market

barriers and specifically targeted supportive policy frameworks demonstrated the highest levels of progress toward impacts. The GEF had successfully sped up the process of broader adoption of mitigation activities as well as improved the processes by which adoption takes place and contributed to economic development including job creation, local benefits, and general awareness.

The evaluation recommended that GEF-6 continue and strengthen the focus on interventions that tackle barriers to broader adoption in a comprehensive way. In addition, the evaluation noted the need for the GEF to improve its methodology for measuring GHG emissions and calculating emissions reductions at project completion.

3.5 Fifth Review of the Financial Mechanism

The UNFCCC's Fifth Review of the Financial Mechanism found that GEF programs and policies continued to be consistent with the objectives of the UNFCCC and found evidence that GEF resources had good results and impacts (UNFCCC Standing Committee on Finance 2014). The review also showed improvements in the transparency of the GEF decision-making process, significant improvements to the length and efficiency of project cycles, and high responsiveness to COP guidance. Success in ensuring stakeholder involvement at the GEF Council and project implementation levels was noted, however, the review recommended that the GEF continue to deepen stakeholder engagement to foster ownership of projects and programs in recipient countries.

Despite improving the methodologies for measuring GHG emissions reductions and avoidance, consistent reporting and measuring the cost-effectiveness of interventions remained a challenge for GEF programs and projects. The review recommended that the GEF continue to

harmonize and improve the methodologies for measuring results and impacts. In addition, the review noted that the GEF could consider collaborating with the GCF to harmonize impact indicators and set norms to establish consistent reporting procedures. The evaluation also noted that the GEF could operationalize the GCF results-based management framework to make progress toward improving measurements.

3.6 Summary

This study uses the previous evaluative evidence—reviewed above—as a foundation. The findings and conclusions of these previous assessments reveal several trends. Overall, the evaluations show that the GEF has been successful in designing and implementing CCM programs and projects despite limited resources. The need to mobilize additional resources and prioritize the programs to receive funding was emphasized in both OPS4 and OPS5. The studies also highlighted the importance of the clarity of the GEF's strategic directions, goals, and objectives, and emphasized the need to improve this clarity and transparency at varying stakeholder levels. In particular, OPS5 recommended an overhaul of the GEF business model to better support GEF's catalytic intervention logic. In addition, the evaluations stressed the importance of strengthening communications and coordination between stakeholders. Engagement of stakeholders at the national level as well as a portfolio approach at the national level were also recommended to ensure maximum long-term progress toward environmental benefits. The evaluations also consistently recommended improvements in data collection, monitoring, and evaluation to improve the understanding of the impact of the portfolio as a whole.

4: Relevance of GEF climate change support

4.1 Relevance of the GEF strategy and programming to the guidance and decisions of the UNFCCC COP

The GEF has been highly responsive to relevant guidance and decisions from the UNFCCC from both strategic and programming perspectives.

RELEVANCE OF THE GEF STRATEGY

The GEF-6 Climate Change Focal Area Strategy is responsive to UNFCCC guidance. Although UNFCCC guidance on CCM programming issues relevant to the GEF Strategy continues to be comparatively rare, the GEF-6 Strategy contains elements that respond to all guidance provided. To inform this assessment, a guidance-strategy mapping analysis for climate change mitigation was conducted as an update to the analysis of convention guidance provided in Technical Paper 2: Climate Change Mitigation (GEF IEO 2012a), which covered COP-1 through COP-17 and was prepared as part of the 2013 Evaluation of the GEF Focal Area Studies in support of OPS5. The present analysis covers COP-18 through COP-21. For the detailed results, see [annex C](#).

A similar guidance-strategy mapping analysis was conducted in Technical Paper 7: Climate Change Adaptation under LDCF and SCCF (GEF IEO 2012b) to assess the responsiveness of the LDCF/SCCF Strategy to the guidance of the UNFCCC on climate change adaptation. Building on this analysis, the

2016 LDCF and 2017 SCCF evaluations confirmed that the GEF has also been largely responsive to COP guidance on adaptation.

RELEVANCE OF GEF PROGRAMMING

Overall, the GEF has supported climate change activities that are coherent with UNFCCC COP guidance and decisions. In the climate change focal area, a review of GEF-6 CCM projects ($n = 61$) demonstrated responsiveness to UNFCCC guidance related to technology transfer, Article 6 of the UNFCCC, and capacity development.¹ Specifically, 26 percent of project designs included support for technology transfer or technology needs assessments; 80 percent of project designs included education, training, and public awareness components relevant to Article 6; and 100 percent of project designs included capacity building components. The Technology Needs Assessments-Phase III project (GEF ID 9452) highlights responsiveness to the request to continue providing financial

¹The review is based on project concepts only, as detailed in available project documents (e.g., PIFs). The review included all GEF-6 projects in the GEF PMIS as of January 9, 2017. The review excluded canceled and parent/child projects; enabling activities; multifocal area projects with climate change components; and LDCF, SCCF, and multitrust fund projects. The resulting sample size for this review included 61 GEF-6 CCM projects. The review looked at coherence between the GEF-6 Programming Directions and the 61 CCM projects that received at least PIF approval.

support to other non-Annex I parties to conduct or update their technology needs assessments. Aligned with objective 3, program 5 of the GEF-6 Programming Directions (GEF Secretariat 2016), this project supports 20 countries with completing technology needs assessments and provides a capacity building package for the countries to pursue their technology objectives.

In OPS5, the UNFCCC Secretariat highlighted concerns about the lack of GEF support responding to COP guidance on the implementation of Article 6 of the UNFCCC (education, training, and public awareness). Since OPS5, however, the GEF has taken significant steps toward implementing the Doha work program, and such concerns were not raised in interviews conducted for this study. From 2012 to 2015, the GEF has provided at least \$67.7 million in support of the Doha work program toward education, training, and public awareness (GEF 2016). The GEF has continued to program resources for activities related to Article 6 in GEF-6, as noted above.

All 44 enabling activities approved in GEF-6 support UNFCCC reporting requirements such as BURs, INDCs, national communications, and nationally appropriate mitigation actions. An additional four MSPs support 36 countries in their INDCs, and a global FSP (GEF ID 6925) supports 39 LDCs and SIDS to prepare their BURs. The GEF's responsiveness to UNFCCC's request to give due consideration to funding for Africa, LDCs, and SIDS has also been evident in resources programmed for regional and single-country projects, representing more than a third of such projects in GEF-6. Of these projects, approximately 80 percent are MSPs or FSPs, covering a range of topics, from sustainable urban transport to renewable energy systems in small islands to geothermal exploration.

Areas where the GEF has programmed fewer projects, but has still demonstrated responsiveness to addressing guidance issued by the UNFCCC, include support for the operationalization and activities of the Climate Technology Center and Network (8 percent of projects reviewed) and incorporating results-based financing or a performance-based mechanism linked to emissions reductions (7 percent of projects reviewed).

GEF climate change adaptation activities are, for the most part, also highly relevant to UNFCCC guidance and decisions, as determined by the recently conducted evaluations for the SCCF and LDCF. Of the LDCF projects reviewed, the weakest level of coherence is related to UNFCCC guidance calling for projects to be "cost-effective and complimentary to other funding sources." SCCF projects are very explicitly defined and thus are invariably linked to UNFCCC guidance. However, there is a stronger level of coherence for activities related to technology information, capacity building, and support of enabling environments for technology transfer.

RESPONSIVENESS OF THE GEF POST-STRATEGY

The GEF has also been responsive to guidance from the UNFCCC issued after the GEF-6 strategy was finalized. Particular responses are detailed below.

Gender

A COP-21 decision requested that gender mainstreaming be implemented both within the GEF's portfolio and structure. The review of GEF-6 CCM projects showed that nearly all project designs in GEF-6 included gender considerations such as key actions to promote women's role in implementation of the project/program; gender analysis during project preparation; gender

disaggregated indicators; cobenefits for gender equality; gender-sensitive policies; and a gender mainstreaming strategy or plan. The FSP Green Energy SMEs [small and medium-size enterprises] Development Project (GEF ID 9191), for example, has been designed with an explicit focus and consideration of the role of women as potential beneficiaries of green energy services and stakeholders in developing green energy markets. The project results framework includes a number of gender-related indicators, and women were identified as one of the main target groups for the provision of training and technical capacity building. The project also aims to build on women's leading roles in their communities to help mobilize interest and raise awareness about green energy solutions.²

Similarly strong performance on gender was found in the LDCF and SCCF evaluations. Among GEF-6 projects, over 90 percent of LDCF projects and nearly 90 percent of SCCF projects either include or give a strong indication that a gender mainstreaming strategy or plan is being or will be developed. The approval of the GEF Policy on Gender Mainstreaming during the GEF-5 cycle and of the Gender Equality Action Plan during GEF-6 are important drivers behind this performance.

INDCs

Approximately 40 percent of GEF-6 CCM projects in the quality at entry review mention alignment with a country's INDC. About a third of those projects were proposed using GEF-6 project templates

that were updated in August 2016 to reflect new selection criteria for projects that are consistent with national priorities such as INDCs. As such, alignment with INDCs has now become a part of the PIF review process in response to the Paris Agreement.

The GEF continues to make resources available for the preparation of INDCs. A component has been added to the Global Support Program for national communications and BURs to provide technical assistance to countries to prepare their INDCs. The GEF has provided support for INDC preparation in 46 countries, of which 44 submitted their INDCs to the UNFCCC ahead of COP-21. In addition, four global GEF-6 MSPs (IDs 8004, 8024, 9087, and 9105) aim to strengthen institutional arrangements and build capacities for the preparation, implementation, and monitoring of INDCs.

The GEF is also encouraging governments to consider aligning their GEF-6 programming with INDC planning and reporting. Specifically, the GEF is working with national governments toward this consideration, through national dialogues, bilateral discussions, expanded constituency workshops, as well as through project reviews.

Capacity-building Initiative for Transparency

In Decision 1/CP.21, paragraph 86, the COP urged and requested the GEF to make arrangements to support the establishment and operation of the Capacity-building Initiative for Transparency (CBIT) as a priority reporting-related need, including through voluntary contributions to support developing country parties in GEF-6 and future replenishment cycles, to complement existing support under the GEF.

The GEF swiftly mobilized to accommodate this mid-cycle request. In interviews, the UNFCCC Secretariat commended the GEF's responsiveness to this request; such a trust fund had not been

²The following GEF-6 projects are also indicative of GEF's responsiveness to mainstream gender within its portfolio and structure: De-risking Renewable Energy Investment (GEF ID 9192), the Climate Finance Aggregation for Developing Countries (GEF ID 9309), Renewable Energy for the City of Marrakech's Bus Rapid Transit System (GEF ID 9567), and Scaling up the SE4ALL Building Efficiency Accelerator (GEF ID 9329).

originally programmed for and was established and capitalized by the GEF remarkably quickly. On June 7, 2016, the GEF Council approved a new CBIT trust fund along with programming and implementation modalities. Following the GEF Council approval, in August 2016 the World Bank's role as the Trustee of the CBIT Trust Fund was approved. The CBIT Trust Fund was established in September 2016, in accordance with the World Bank's applicable policies and procedures.

PIFs for four CBIT projects—including one focused on establishing a global CBIT coordination platform to support the implementation of the Paris Agreement—were all approved in November 2016. Since November 2016, the GEF has continued to approve projects under the CBIT Trust Fund. According to documents from the GEF 52nd Council Meeting, CBIT efforts are expected to be an integral part of the GEF's climate change support for GEF-7.

Sustainable forest management

In Decision 1/CP.21, paragraph 54, the COP recognized the importance of adequate and predictable financial resources, as well as alternative policy approaches for the sustainable management of forests. An incentive for sustainable forest management was approved by GEF Council through the GEF-6 Programming Directions. As of June 2016, recipient countries had utilized \$189 million of the incentive. In addition, the GEF has invested \$35 million into sustainable forest management through its integrated approach pilots and the GEF-6 nongrant instrument pilot, bringing the total GEF financing toward sustainable forest management under GEF-6 to \$601 million as of June 2016 (GEF 2016).

Nongrant instruments

In Decision 8/CP.21, paragraph 10, the COP welcomed the exploration of innovative nongrant

instruments by the GEF, and encouraged the GEF to work with its Agencies, recipient countries, and the private sector to submit proposals. Since the beginning of GEF-6, the GEF has awarded six nongrant CCM projects (see, e.g., GEF IDs 9047 and 9043). The GEF Secretariat has also received both formal and informal requests for nongrant projects that were in excess of the resources available under the GEF-6 nongrant instrument pilot (GEF 2016).

Green Climate Fund

The UNFCCC issued a request for the GEF to engage with the GCF and further articulate and build on the complementarity of policies and programs within the financial mechanisms of the UNFCCC. None of the GEF-6 projects reviewed specifically mentioned coordination with the GCF. However, an interview with the GCF Secretariat indicated that a project targeting buildings in Bosnia is being developed in coordination with the GEF.³

GEF-6 projects have been prepared in coordination with other large multilateral climate funds such as the CIF. For example, the GEF-6 FSP IBRD Geothermal Energy Upstream Development Project in Indonesia includes a \$49 million cofinancing contribution from the Clean Technology Fund (CTF). In addition, the GEF-6 FSP De-risking Renewable Energy Investment includes a \$5.5 million cofinancing contribution from the European Bank for Reconstruction and Development/CIF to collaborate with the Kazakhstan Renewable Energy Financing Facility on designing and financing a package.

³In addition, at least one closed GEF project has led to a GCF project. From GEF-4, LGGE Improving Energy Efficiency in Buildings project in Armenia (GEF ID 3935) led to a \$29.8 million GCF project that aims to build on the GEF intervention.

4.2 The GEF's added value and complementarity in climate finance

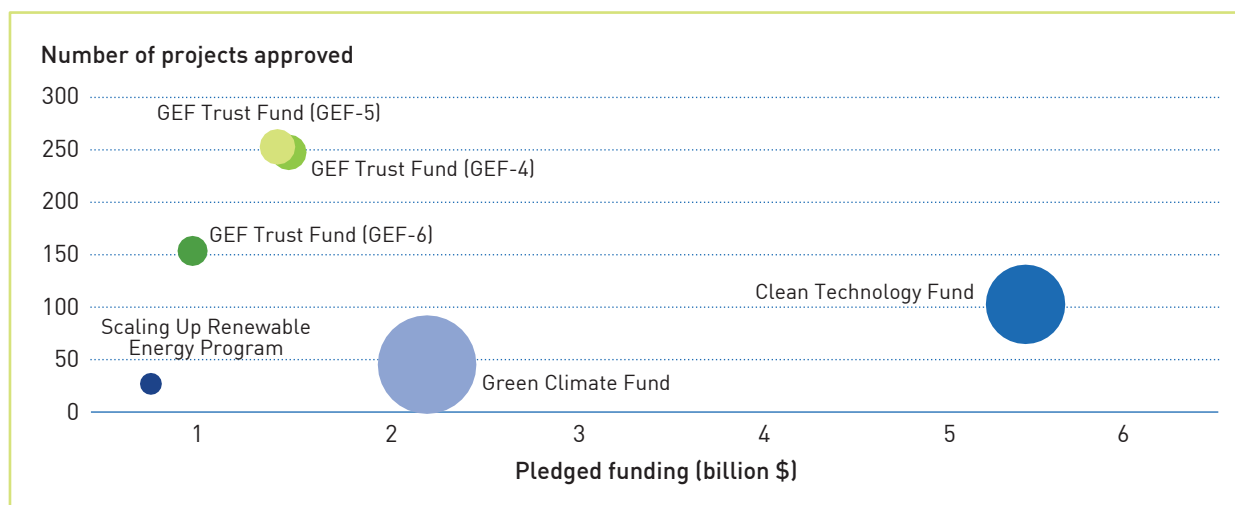
The global landscape for climate change finance has evolved significantly since the GEF became the first operating entity of the financial mechanism of the UNFCCC in 1996. While the GEF was a principal source of donor financing for climate change in the 1990s, the landscape has since fragmented, both within and outside the GEF. The GEF now operates the LDCF (2001) and SCCF (2001), and also provides secretariat services for the Adaptation Fund. Additionally, many carbon finance facilities have become active. New multilateral institutions such as the CIF and GCF have been established, with pledged amounts that far exceed those of the GEF. As the landscape has fragmented, the GEF has become a relatively smaller contributor to climate-related projects (figure 4.1). The GEF's available resources are certainly not insubstantial for its many recipient countries, however; the challenge is to use those resources in the most effective way to engage other sources of finance and catalyze transformational change.

In interviews and through desk analysis, several features strongly emerged as distinguishing the GEF from among other multilateral climate funds.

- **The GEF's provision of significant and flexible grant financing.** Interviewees emphasized the GEF's added value in providing grant financing—a relatively scarce resource in the climate finance space. While grants are eligible instruments in other multilateral climate funds, they have more rarely been used. For example, the CIF's CTF has used grants for just 3 percent of its investments; the large majority of its investments have been provided via softer- and harder-termed concessional loans (CPI 2016). Grants have featured more frequently in GCF mitigation projects; 11 of 13 approved GEF mitigation projects have included a GCF-funded grant component, accounting for 15 percent of total GCF funding to these projects.⁴ The grant

⁴Based on 13 approved projects and GCF project data as of April 28, 2017. Does not include projects with both mitigation and adaptation components. www.greenclimate.fund/projects/browse-projects

FIGURE 4.1 Pledged funding for climate change funds



SOURCE: Data from Climate Funds Update as of October 2016; www.climatefundsupdate.org.

modality helps facilitate some of the GEF's other comparative advantages, discussed below.

- **The GEF's focus upstream on the enabling environment to support broader public and private climate investment, including through policy, legal, and regulatory reform and capacity building.** Interviewees from the GEF Agencies, UNFCCC Secretariat, and other multilateral climate funds emphasized the GEF's crucial role in this area, which is helped by the GEF's grant modality; governments are typically unwilling to borrow resources for such technical assistance. A recent report by the World Resources Institute identified support for capacity building as an important role for the GEF in complementing the GCF and CTF in supporting systemic shifts for mitigation (Amerasinghe et al. 2017). Regulatory reform has also received relatively less attention from other, more investment-focused funds. For example, an evaluation of the CIF found that few CTF investment plans sought to address regulatory barriers, despite the fact that the policy, regulatory, and macroeconomic situations in more than half of CTF countries had the potential to slow down, limit, or negate transformation and replication (ICF International 2014). That same evaluation also found that where complementary technical assistance had been sought (e.g., through the GEF), positive results had been achieved. This study and the GEF IEO's study of the impact of GEF climate change mitigation activities in four countries (GEF IEO 2014a) further support the importance of such foundational work (see [section 5.3](#)).
- **The GEF's emphasis on piloting and demonstrating technologies and financial approaches that could be scaled up by other partners.** Particularly in the light of the nascent GCF, many GEF Agencies felt that the GEF

(through its climate change mitigation focal area, as well as SCCF and LDCF) had potential to be an incubator for countries to test and refine project concepts, prior to seeking large-scale finance through the GCF. Related is a perception of the GEF as a key contributor to **innovative and risk-sharing approaches** in this context of piloting and demonstration, though some stakeholders interviewed also felt there was scope for the GEF to take more risks than it has to-date. GEF Agencies also identified the SCCF's support for innovative projects to be a comparatively distinctive element of the fund.⁵

- **The GEF's provision of finance for innovative projects which have subsequently been scaled up or secured additional investments.** Given its relatively smaller size of project financing—compared to the CIF or the GCF—the GEF can, and has, supported projects that have been the foundation for further investments by other partners to scale up results, although such projects appear to be the exception rather than the rule. Other evaluations have also highlighted the potential and actual complementarity of GEF support with other funds, including evaluations of the CIF and the World Bank's engagement with the GEF (IEG 2013). As an example, a \$43 million GEF grant to Morocco for some of the first trials of concentrated solar thermal power in a developing country led to a subsequent project wherein the Moroccan Agency for Solar Energy secured over \$3 billion for scaling-up the Noor-Ouarzazate complex, with funds from the CTF, World Bank, GTZ, and African Development Bank. A more recent example is the Grid Connected Rooftop Solar Program in India. World Bank (\$500 million) and CTF (\$125 million) funds will enable

⁵Project-level stakeholders were less clear as to the SCCF's distinctiveness.

the participating commercial bank to extend loans for rooftop solar systems at or near the base rate, complemented by a GEF grant (\$22.93 million) that will support an innovative risk mitigation mechanism to enable lending to riskier customer categories, such as small and medium enterprise commercial and non-banking financial institutions, and support strengthening the investment climate and build capacity among main stakeholders.

- **The GEF’s ability to fund integrated projects across focal areas and including both climate mitigation and adaptation aspects.** Interviewees noted the GEF’s uniqueness in funding projects that address multiple environmental issues (i.e., across focal areas). The recent World Resources Institute report also identified cross-sectoral programming as a niche for the GEF. In particular, GEF projects related to land, forest, and agriculture have demonstrated biodiversity and land benefits—but also, notably, climate benefits. About 20 percent of the GEF’s expected GHG emissions reductions in GEF-6 are associated with sustainable land management projects; a further third are in focal areas other than climate change.
- **The GEF as an experienced partner.** The GEF’s long history is seen as an asset; the GEF can offer learning and knowledge across multiple intervention areas that is relevant for other and newer organizations such as the GCF.
- **The GEF supports countries in meeting obligations to conventions.** The GEF provides unique and critical support for countries to meet their obligations under the UNFCCC, including support for nationally appropriate mitigation actions, national communications, BURs, and INDCs. The GEF’s historic mandate to provide such support is seen as one of its comparative advantages among other climate funds.

The designation of the GCF as a second operating entity of the financial mechanism is a particularly important milestone in the UNFCCC climate finance architecture. Recently, the 21st COP to the UNFCCC gave both the GEF and the GCF important roles in implementing key aspects of the historic Paris Agreement, which commits parties to aim to hold global temperatures well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The recent World Resources Institute report also found that stakeholders largely agreed that the GEF and the GCF should continue in the long term. The GCF has approved 43 projects to date, for which 41 percent of funding focuses on mitigation, 27 percent of adaptation, and 32 percent on cross-cutting targets.

As the GCF builds its portfolio of climate investments, there is great scope for complementarity, as well as a risk for overlap between the scope of its activities—focused on mitigation, adaptation, and private sector—and the activities funded by the GEF, LDCF, SCCF, and activities financed outside the framework of the UNFCCC. The GCF has a broad mandate. And yet, as interviewees as well as the recent Fifth Review of the Financial Mechanism of the UNFCCC (UNFCCC Standing Committee on Finance 2014) noted, duplication may not be the greatest concern, given that substantially more climate finance is necessary than is currently provided through all of these climate funds combined. The need to address barriers to scaling up climate investment in developing countries remains significant, and multilateral grant and concessional finance is expected to continue to play an important role in addressing these barriers. At the same time, stakeholders interviewed for this study, as well as recent reports (e.g., Amerasinghe et al. 2017), have pointed out that clearer roles among climate change funds would help donors and recipients make decisions about

how and when to engage. In addition, more strategic collaboration among funds—building on each’s comparative advantages—could help promote more transformational change.

The GEF must continue to identify and articulate its niches and to carefully program its resources according to these niches. As it currently stands, the GEF does not have an advantage in terms of the volume of resources available, so it must be particularly strategic in how it applies its limited funds. The comparative advantages identified above provide suggestions for how to do that.

4.3 Continuing relevance of the GEF climate change focal area

Overall, the strategic fit of project concepts approved in GEF-6 to the GEF-6 programming directions is clear, and the focal area remains highly relevant. All GEF-6 CCM projects reviewed support one or more of the Programs in the GEF CCM Focal Area Strategic Framework,⁶ with the exception of projects that clearly align with supporting the CBIT—a testament to GEF’s nimbleness and flexibility in responding to guidance from the UNFCCC during COP-21.

The focal area also continues to be highly relevant in the broader context of a changing global climate. Atmospheric GHG concentrations continue to increase, reaching a record high of 400 parts per million in 2015—a 43 percent increase over pre-industrial levels (U.S. Department of

⁶So far in GEF-6, Program 1 has the highest proportion of projects (43 percent), followed by projects that align with multiple programs (16 percent), projects that align with Program 2 (13 percent), and projects that align with Programs 3 and 5 (11 percent each). Only one CCM project (ID 9048) has been approved so far that aligns with Program 4, which promotes conservation and enhancement of carbon stocks in forest and other land use, as well as climate-smart agriculture.

Commerce 2017). The growth in GHG emissions, left unchecked, is projected to result in a global surface temperature increase of 3.7°C to 4.8°C by the end of this century (IPCC 2014). In December 2015, 195 nations agreed to keep global warming below 2°C under the Paris Agreement, for which the GEF will serve as the financial mechanism along with the GCF. As noted in [section 4.1](#), the GEF has moved quickly to implement key aspects of the Paris Agreement, including the establishment and operation of the CBIT. The GEF has also taken significant efforts to reduce GHG emissions through its projects and programming (see chapter 5), and is expected to continue to help countries meet their INDCs in a complementary and coordinated way.

The GEF has also demonstrated its continuing relevance to other major international climate and development initiatives such as Sustainable Development Goals (SDGs) and the United Nations’ Sustainable Energy for All (SE4All) initiative. Twenty-one percent of projects approved so far in GEF-6 mention alignment with or contribution to SDGs, including SDG 7 on affordable and clean energy; SDG 9 on industry, innovation, and infrastructure; SDG 11 on sustainable cities and communities; and SDG 13 on climate action, among others. Fieldwork in Thailand illustrated how the GEF’s work (specifically through UNIDO) is relevant for 6 of the 30 prioritized SDG targets announced by Thailand’s National Committee on Sustainable Development.⁷ The GEF is also engaged in supporting all four main tracks of SE4All (i.e., financing, efficiency, access, and renewable energy) and is seeking to provide catalytic investment to support specific initiatives. The GEF’s support for SE4ALL’s Global Energy Efficiency Accelerator Platform is seen as particularly innovative. For example, the GEF-6 MSP Scaling

⁷These are 7.3; 8.1; 8.4; 9.4; 12.4; 13.2.

up the SE4ALL Building Efficiency Accelerator (GEF ID 9329) will help accelerate the uptake of energy efficiency improvements in buildings by 2030 by introducing SE4All to 50 cities over the next two years, from which 30 are expected sign formal commitments to double the rate of energy efficiency improvements in their buildings. The GEF-6 MSP Increasing Investments in District Energy Systems in Cities—a SE4All Energy Efficiency Accelerator (GEF ID 9320) and the GEF-6 FSP Towards Sustainable Energy for All in Mozambique (GEF ID 9225) are also supportive of SE4All objectives.

The review of GEF-6 CCM projects also showed that GEF project designs have evolved over time compared to earlier replenishment periods (see also [section 5.3](#)). Specifically, GEF-6 projects have begun to shift from single-sector and technology-specific interventions to more multifaceted projects that build on the integrated programming approaches that emerged in the GEF-5 period and were further emphasized in GEF-6, offering unique value for climate change mitigation efforts moving forward. In particular, the focus of GEF CCM projects has moved away from traditional technology demonstration projects and toward more integrated projects with systemic approaches. Instead of focusing on one initiative to address climate change mitigation, these projects take a more holistic approach and leverage a much broader range of tactics. For example, the GEF-6 FSP Sustainable Cities: Integrated Green Urban Development in Ashgabat and Awaza (GEF ID 9279) addresses climate change through energy efficiency, renewable energy, sustainable transport, green roofs and establishment of green spaces, climate-resilient and low-carbon tourism development, and managing water and waste for these cities in Turkmenistan.

Other notable shifts observed in the GEF-6 CCM portfolio include:

- **Synergies across focal areas.** The GEF-6 CCM strategy encourages countries to seek synergistic opportunities to address global environmental concerns. More than 40 percent of approved projects in GEF-6 seek to enhance synergies across focal areas, mostly through integrated urban management and mitigation-adaptation activities. Box 4.1 offers some examples.
- **Financial models/mechanisms and market-based approaches.** GEF programming has clearly shifted toward projects that aim to demonstrate financial models/mechanisms and market-based approaches. Based on the terminal evaluation review (see [section 5.3](#)), fewer than a third of CCM projects in earlier replenishment periods demonstrated these approaches. Of the projects approved so far in GEF-6, almost two-thirds aim to demonstrate these approaches. For example, projects approved in GEF-6 include revolving funds, energy service company business models, incentive mechanisms (both subsidy and nonsubsidy), custom tax exemptions, energy savings trading schemes, commercial banking schemes for the public sector, and financial de-risking instruments, among others.

Among approved energy efficiency projects, for example, there is also a move toward the use of financial incentives to address significant economic (lack of incentive) and budget (raising finance) pressures in the public (buildings, lighting) and residential sectors. GEF-6 projects propose to design and test innovative financing mechanisms, including using GEF funds as equity to leverage debt, or match commercial loans, provide guarantees, and incent green mortgages. These are reinforced by a continuing level of support for policy and regulatory frameworks and capacity building to address legal, technical, and institutional challenges.

BOX 4.1 Examples of GEF-6 CCM projects with integrated approaches

- The Strengthening National Institutions project in Kenya (GEF ID 9674) is expected to improve information-based decision making in the land-based sectors, as well as facilitate sustainable development related to food security, catchment integrity and water security, climate resilience, adaptation, and poverty alleviation.
- The Upgrading of China SHP Capacity project (GEF ID 6919) focuses on water-energy nexus initiatives.
- The Transfer of Environmentally Sound Technology (TEST) Methodology project in Cambodia (GEF ID 9640) prioritizes GHG emissions reductions, but also takes into account chemical management and pollution control, water quality and human health, biodiversity, waste minimization, and socio-economic aspects.
- The Vientiane Sustainable Urban Transport Project in Lao People's Democratic Republic (GEF ID 9146) provides integrated solutions to address the sustainable transport-land use nexus while also preserving cultural heritage, providing benefits for tourism development, and providing safety, health, and economic benefits for city residents.
- The Catalyzing Environmental Finance for Low-Carbon Urban Development project in Bosnia-Herzegovina (GEF ID 9151) will work at the municipal level to implement initiatives related to low-carbon municipal buildings and utilities, low-carbon waste management, and low-carbon transport and logistics for waste management.

- **Private sector engagement.** The review of GEF-6 projects also showed a strong emphasis on enhancing private sector engagement and creating investment opportunities. Nearly 40 percent of the projects approved so far in GEF-6 include components directed at engaging the private sector including public-private partnerships, risk mitigation and structured financing tools that reduce risk and attract investors, and innovative and flexible financial instruments (see above). Private sector engagement is identified in the GEF-6 programming directions as one of the five main innovative programming options for the GEF CCM focal area to meet the 2°C target.

5: Climate change mitigation impact, results, and effectiveness

5.1 Impact

GEF support aims to help countries reduce GHG emissions through direct means—emissions reductions attributable to investments made during the project’s implementation—as well as consequentially (or indirectly), through broader adoption of the outcomes of a GEF project plus longer-term emissions reductions from behavioral change. Broader adoption of a GEF project occurs through several avenues, including sustaining, mainstreaming, replication, scaling-up and market change, as discussed in [section 5.2](#). This chapter focuses on the GEF’s achievements in terms of direct and indirect (consequential) GHG emissions reductions.

HIGHLIGHTS OF IMPACT ACHIEVEMENT

Recent evaluations of GEF CCM activities have found evidence of significant impacts in countries with some of the largest GEF climate change portfolios, as well as evidence of transformational projects in the climate change focal area. Sixteen of the 18 projects assessed in China, India, Mexico, and Russia resulted in significant direct GHG emissions reduction impact. The 2014 impact evaluation found that in most cases, direct GHG impacts were sustained after project completion. In other cases, the GHG impacts changed after the project’s terminal evaluation, making it necessary to adjust these assessments downward. Indirect GHG emissions reductions, achieved through

casual links from the projects to other activities, were estimated to be multiple times greater than direct emissions reductions, but could not be verified.

Among the 16 projects reviewed by the impact evaluation with direct impact, 4 dominated in terms of making significant contributions to GHG avoidance, and 3 of these were in China. One of these projects—the first phase of the China Renewable Energy Scale-up Program, approved in 2005—was particularly transformational. The programmatic, sectorwide intervention combined a GEF grant (GEF ID 943, \$40.2 million) focused on supporting the development of the legal, regulatory, and policy framework needed to stimulate demand for renewable energy and build a strong renewable energy equipment manufacturing industry, with two World Bank loans (\$87 million and \$86.3 million) for supporting pilot investments in four participating provinces. Five years after the project’s closing in 2011, the project performance assessment report concluded that the project has made a substantial contribution to the transformation of China’s renewable energy sector from an early piloting and demonstration stage to its development into a global leader in wind energy generation and the manufacture of wind power equipment. A recent impact evaluation of GEF CCM support also found casual links to scaling up project impacts rooted in the project’s capacity-building efforts and establishment of government policies. A key driver of success was

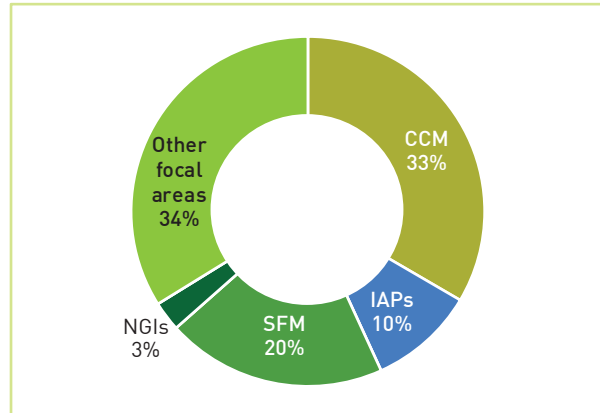
the multiple-component approach combining institutional development and capacity building, technology improvement (addressing quality and quantity), and investment activities in a single intervention. The project also worked with a wide range of stakeholders to achieve consensus about key policy reforms and achieve comprehensive market change.

DIRECT AND INDIRECT GHG EMISSIONS REDUCTIONS

Three years into the GEF-6 programming period,¹ the GEF CCM focal area has approved projects and programs with GHG emissions reduction targets that account for 55 percent of its 750 million tons of carbon dioxide equivalent (MtCO₂eq) target. Stand-alone projects in the CCM focal area are only a third of the total expected emissions reductions from the GEF-6 portfolio, however. When the contributions to GHG emissions reductions from other focal areas and initiatives are counted, the reported expected results are 166 percent of the CCM target, or 1,245 MtCO₂eq. The relative contributions of each focal area and initiative are shown in figure 5.1.

To date, the GEF has not systematically tracked or reported estimated emissions reductions achieved at the time of project closure. As noted in chapter 3, a technical document prepared for OPS5 assessed 88 CCM projects with estimates for direct mitigation expected at project start and at project close, and with terminal evaluations accessible as of August 2013. This study provides an update to that analysis by reviewing terminal evaluations for GEF CCM projects completed after 2012 ($n = 52$) to assess the direct and consequential (indirect) GHG emissions reductions estimated at project closure, as well as the reported reasons

FIGURE 5.1 Contributions to expected GHG emissions reductions in GEF-6



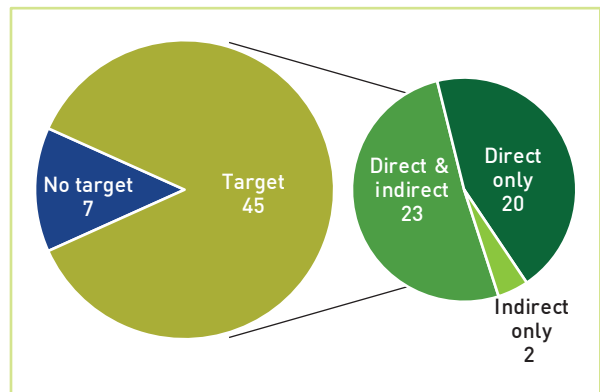
SOURCE: GEF IEO terminal evaluation review data set.

NOTE: Data are as of April 30, 2017. IAP = integrated approach pilot; SFM = sustainable forest management; NGI = nongrant instrument.

for over- or under-achievement of the targeted value at project approval.

Of the 52 projects analyzed, 23 had both direct and indirect GHG targets; 20 had direct GHG targets only; 2 projects had an indirect GHG reduction target only; and 7 had neither direct nor indirect GHG reduction targets (figure 5.2).

FIGURE 5.2 Number of projects analyzed by emissions reduction target type



SOURCE: GEF IEO terminal evaluation review data set.

¹As of April 30, 2017.

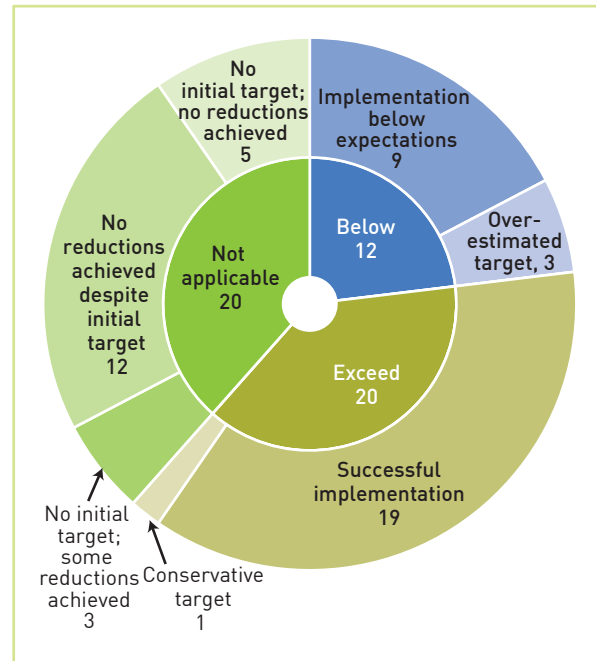
Direct emissions reductions

Twenty of the 52 projects analyzed exceeded their direct GHG emissions reduction targets² (figure 5.3), and of those 20 projects, 9 exceeded their direct targets by more than double. For example, the Promoting of Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana project (GEF ID 3881) exceeded its original GHG reduction goal by 459 percent due to greater than expected refrigerator energy efficiency savings associated with enacted legislation.

Twelve of the 52 projects fell short of achieving their direct GHG targets. Of these projects, eight fell short of their direct targets by more than half. For example, the Micro-turbine Cogeneration Technology Application Project in Indonesia (GED ID 2935) estimated virtually no GHG reductions (0.0006 MtCO₂eq. over five years) at project closure, compared to its goal (1.5 MtCO₂eq. over five years) because of limited natural gas supply, higher-than-expected natural gas prices, limited numbers of technology providers, and technology operations and maintenance problems. Many terminal evaluations specifically noted that direct GHG emissions targets had been unrealistic, given the extent of resources and the expected time frame. Other common reasons for lower achieved direct GHG reductions than expected from initial targets include the following:

²Of the 52 projects analyzed, 11 reported direct annual GHG reductions, while 20 reported only direct GHG reductions over their project lifetimes. To compare the impact of projects with only lifetime GHG reductions to those reporting annually, the lifetime reductions were normalized to an annual number by dividing GHG reductions by the number of years in which those reductions are expected to occur. Terminal evaluation reviews containing only direct annual GHG reductions resulted in 83 MtCO₂eq. annually, while terminal evaluation reviews containing only direct lifetime GHG reductions resulted in 41 MtCO₂eq. annually.

FIGURE 5.3 Number of projects with estimated results above and below expectations



SOURCE: GEF IEO terminal evaluation review data set.

- Ambitious initial targets
- Lack of verification of emissions reductions from installed renewable energy or energy efficiency projects
- Delayed project implementation due to external factors such as lack of cofinancing and broader economic conditions
- Completion of projects after their planned implementation timelines resulted in an inability to attribute direct renewable energy generation or energy efficiency savings to the project (in many cases, expected future reductions beyond the planned implementation timelines were classified by the terminal evaluation reviews under indirect GHG reductions)

The remaining 20 projects did not have information available to evaluate achievement of their GHG emissions reduction targets.

A number of factors appear to influence the extent of direct GHG emissions reductions. While half of the projects analyzed focused on energy efficiency, nearly all the documented annual and lifetime GHG reductions were associated with these projects. Mixed renewable energy and transportation projects accounted for the small amount of remaining GHG reductions. FSPs accounted for the vast majority of direct emissions reductions, with only a small amount of reductions resulting from MSPs.

Consequential (indirect) emissions reductions

Seventeen out of the 52 projects analyzed reported indirect emissions reductions at project closure. Three projects reported indirect annual GHG reductions totaling 217 MtCO₂eq. annually, and the remaining 14 projects reported indirect lifetime GHG reductions totaling 63 MtCO₂eq. annually.³

Virtually all of the indirect GHG reductions from the projects reviewed resulted from two projects: the Barrier Removal to the Cost-Effective Development and Implementation of Energy Standards and Labeling Project regional project in Asia (GEF ID 2777), which achieved results through building capacity for future adoption of energy-efficient appliances, standards, and labeling programs; and the Phasing-out Incandescent Lamps & Energy Saving Lamps Promotion (PIESLAMP) project in China (GEF ID 3672), which achieved results through successful implementation of energy-saving technologies and unintended positive spillover effects, such as more municipalities replicating project goals and international recognition of an energy-efficient lighting test center.

³To compare the impact of projects with only lifetime GHG reductions to those reporting annually, the lifetime reductions were normalized to an annual number by dividing GHG reductions by the number of years in which those reductions are expected to occur.

While greater in magnitude to the direct GHG reductions, the indirect reductions reported in the terminal evaluations do not fully capture the total GHG impact of the projects, as certain benefits were either unquantifiable (such as GHG impacts from capacity building) or hard to measure (such as the impacts of energy efficiency labeling standards). Thus, while the study found a somewhat limited but nonetheless tangible impact on indirect GHG reductions, examining achievements over a longer timescale (e.g., if GEF ID 3672 results in a further development of energy efficiency standards because of the success of the initial project) would likely result in a greater indirect impact than found in the terminal evaluations.

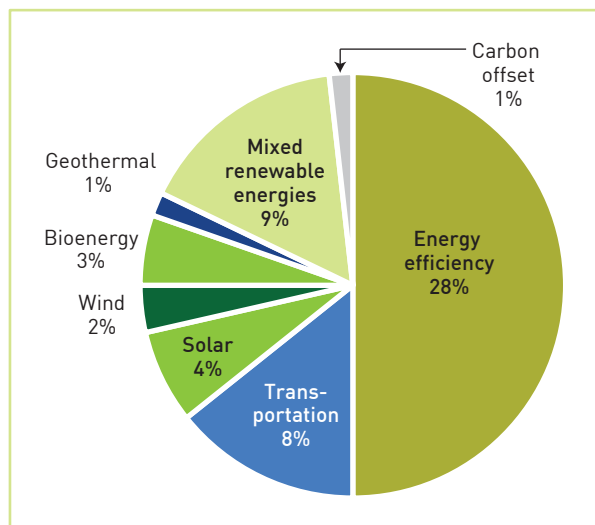
5.2 Catalytic effects of GEF climate change activities

This study systematically reviewed terminal evaluations for GEF-3, GEF-4, and GEF-5 CCM projects completed after 2012 (52 projects) to assess the catalytic effects, or progress toward impact, of activities in the GEF's climate change focal area.⁴ Sixty-one percent of the projects assessed were implemented by UNDP, followed by 23 percent by the World Bank, and the remainder by UNIDO, the Asian Development Bank, and UNEP. FSPs account for 55 percent of the project cohort, with MSPs making up 45 percent. The mitigation technology/sector focus of the projects reviewed is shown in figure 5.4. The terminal evaluation review was also complemented by case studies of closed projects and country field visits to Thailand and Morocco.

About 70 percent of projects analyzed showed evidence of environmental impacts. Some evidence of catalytic effects (broader adoption of technologies,

⁴Of the 56 closed projects in this sample, terminal evaluations were only available for 52.

FIGURE 5.4 Distribution of projects by technology type



SOURCE: GEF IEO terminal evaluation review data set.

approaches, and strategies tested by GEF projects) was observed—to varying extents—in more than 80 percent of the terminal evaluations analyzed.

The most frequently achieved catalytic effect was mainstreaming, which takes place when information, lessons, or specific results of GEF interventions are incorporated into broader stakeholder mandates and initiatives such as laws, policies, regulations, or programs. Broader adoption through mainstreaming was observed in about 70 percent of projects. This achievement reflects the often upstream nature of GEF interventions, as well as the focus of many GEF CCM projects on policy, regulatory, and legal reform primarily around renewable energy and energy efficiency (also see [section 5.3](#)). Performance was less strong for replication, scaling-up, and market changes. Although the projects analyzed frequently lacked articulated strategies to achieve these catalytic effects, evidence of broader adoption through replication and market change was seen in nearly 40 percent of projects analyzed, and

broader adoption through scaling was observed in about 30 percent of projects.

Progress toward impact and achievement of catalytic effects has varied significantly among different clusters of projects. The greatest progress toward impact has been made within the energy efficiency portfolio, where projects more frequently achieved direct GHG reduction impacts and market change, compared to projects focused on renewable energy and sustainable transportation. Projects in Africa and Latin America and the Caribbean showed less evidence of broader adoption through all four pathways (mainstreaming, scaling-up, replication, and market change). Lower achievement of environmental impact and fewer instances of broader adoption were also observed for MSPs, compared to FSPs. Projects showing evidence of environmental impact or catalytic effects were more likely also to have evidence of strong government ownership; 81 percent of projects with environmental impact also has strong country ownership, compared to just 54 percent of projects without impact.

Nearly all the projects with replication effects included both demonstration elements and policy or regulatory measures. Most of these projects cited successful pilot activities, with supportive regulatory conditions, as contributing to their catalytic effects. For example, in addition to the 19 pilot cities that participated in the GEF–World Bank–China Urban Transport Partnership Program (GEF ID 2609), 60 nonpilot cities showed demonstrable interest in implementing sustainable urban transport projects and of those, 26 cities had secured funding and started implementing projects at the time of project closure. These replication effects were attributed to the demonstration effect of successful pilot projects at the local level, as well as the impact of the national public transport strategy that was formulated through the project (State Council Directive #64)

and the influence of the project's capacity building and awareness raising activities. Other projects have achieved replication through the actions of their private sector partners. For example, the terminal evaluation for LGGE: Energy Efficiency in New Construction in the Residential and Commercial Buildings Sector in Mongolia (GEF ID 3010) noted that one of the involved house construction companies had committed to building houses per the designs developed and the revised building codes, norms, and standards—making these elements part of its business strategy—and has since built 220 new homes, with another 200 under construction.

Some of the projects that showed evidence of scaling-up achieved that catalytic effect through securing follow on funding from the GEF and other multilateral and bilateral donors. For example, the LGGE Improving Energy Efficiency in Buildings project in Armenia (GEF ID 3935) developed and initiated a comprehensive scale-up strategy in the form of a \$29.8 million Green Climate Fund project De-risking and Scaling Up Investment in Energy Efficient Building Retrofits in Armenia, which aims to build on the GEF intervention through policy and financial de-risking instruments to address market barriers and achieve a risk-return profile that can attract private investors. In China, the Heat Reform and Building Energy Efficiency Project (GEF ID 1892) helped to identify and inform two follow-on operations and one regulatory technical assistance project: the Urumqi District Heating Project (\$343.2 million/\$100 million World Bank), the Urban Scale Building Energy Efficiency and Renewable Energy Project (\$12 million, GEF ID 4869), and technical assistance on Enhancing the Institutional Model for District Heating Regulation.

Other projects scaled up by contributing to the development of nationally owned programs. For example, the policy and regulatory reform initiated by Renewable Energy Market Transformation

(GEF ID 1894) in South Africa were on track, at the time of project closure, to be sustained through implementation of national programs for both renewable power generation and solar water heating. The project helped develop the National Solar Water Heating Framework, which contributed to the development of a national roll-out program, including broadening its scope to low-income households. The project also supported the government to develop a national training program to accredit solar water heater installers under the Framework. Other projects showed evidence of scaling-up, but to a more modest extent. For example, two energy efficiency projects in Pakistan and Mongolia (GEF IDs 2526 and 3010) noted that local banks planned to scale up coverage and develop additional loan products, based on their positive experience with the pilot program. In response to guidance from the UNFCCC COP, the GEF has also sought to foster innovation and investments through piloting priority technology projects under the Poznan Strategic Program on Technology Transfer, although a recent evaluation of this program found that it was premature to reach conclusions on the contributions to wider scaling-up of investment in climate technologies in developing countries, given that the majority of those projects did not begin until 2011 or 2012, or later (UNFCCC Subsidiary Body for Implementation 2015).⁵

Many of the projects reviewed showed evidence of incremental market changes—such as increased demand for energy efficient products or building design among a segment of a country's population, improved quality of a specific energy efficient product, or a few additional local suppliers entering the market or commercial banks offering energy efficiency loan products. At the time of

⁵As noted above, the sample of projects analyzed for this study included those closed after 2012.

project closure, it was unclear whether these incremental market changes were sufficient to catalyze broader market transformation; market transformation in emerging markets can be a decades-long process. About a quarter of terminal evaluations showing some market changes referred to underlying energy pricing and subsidy barriers that impede broader market transformation. In GEF-6, a new program has sought to focus more attention on economic or sector reform, although it has faced challenges in gaining interest from countries and support from central ministries.

A recent impact evaluation of GEF CCM interventions in China, India, Mexico, and Russia offers some insight into the GEF's effect on longer-term market change. That evaluation found that most of the projects with high catalytic effects adopted a comprehensive, multicomponent approach to addressing market barriers and promoting market change, analyzing all stakeholders and barriers a technology might face. The China Renewable Energy Scale-up Program is an example of one of the most multicomponent approaches reviewed and has also been identified as a particularly transformative intervention in the GEF IEO's recent Evaluation of GEF Support for Transformational Change (GEF IEO 2018b). The Uruguay Wind Energy Program (GEF ID 2826) offers another example of a transformative, multicomponent program; this program supported the creation of an enabling policy framework for wind energy, strengthened capacity and business skills to prepare and deliver projects through public and private models, and addressed technological barriers, including implementing a pilot wind power plant. The next section reviews some of the components of GEF approaches for climate change mitigation.

5.3 GEF approaches for climate change mitigation and lessons learned

GEF intervention approaches have included addressing the policy, regulatory, and legal environment; building the institutional and technical capacity and awareness of key institutions and stakeholders; piloting/demonstrating technologies, business models, market-based, or financing approaches; and engaging private sector through many of these approaches. Many projects have combined these components to good effect, as mentioned above and illustrated by table 5.1 and case study examples of projects in Thailand and Morocco in box 5.1. Specifically, the table illustrates how GEF approaches have been combined to address multiple market barriers for a sample of closed energy efficiency projects.

ADDRESSING THE POLICY, REGULATORY, AND LEGAL ENVIRONMENT

The terminal evaluation review showed that GEF climate change projects have frequently focused on developing and proposing policy, legal, and regulatory measures to address CCM (84 percent of projects reviewed). Nearly half of the projects analyzed included components focused on certification, labels, and standards. The GEF has sometimes been the first to tackle policy barriers as a key cornerstone of the enabling environment, such as in the sustainable transport sector in Dushanbe, Tajikistan.

The 2014 impact evaluation of GEF CCM support in China, India, Mexico, and Russia found that significant impact can be leveraged through policy and capacity-building activities. The evaluation also emphasized the importance of public sector policies, institutions, and strategies for private sector replication of the approaches piloted by the GEF. In countries where laws have been drafted or amended with GEF support, substantial results

TABLE 5.1 Combining barrier removal approaches in energy efficiency projects

Project/program	Enabling environment ^a	GEF approach				
		Policy ^b	Finance mechanism ^c	Capacity building	Awareness	Technology demonstration ^d
China Utility Based Energy Efficiency Program						
Energy Efficiency Program for the Industrial Sector (Tunisia)						
Electric Cooperative System Loss Reduction Project (Philippines)						
Market Transformation of Energy Efficient Appliances in Turkey						
Promoting Energy Efficiency in Public Building in Uzbekistan						
Achieving Reduction in GHG Emissions through Advanced Energy Efficiency Technology in Electric Motors (India)						
Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings (Mauritius)						
Energy-Efficient Design and Construction of Residential Buildings (Kazakhstan)						
Promoting Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market (Ghana)						

a. Pre-existing energy efficiency policy and regulatory frameworks, national strategy.

b. Energy efficiency and conservation policies, building codes, minimum energy performance standards, and energy labels.

c. Investment grants, partial loan guarantees, risk-sharing facilities, etc.

d. Demonstration, deployment, and transfer of energy efficient technologies.

have been achieved. For example, in Vietnam, where the GEF assisted with the National Strategy for Urban Lighting, 25 provinces developed regulations on public lighting, and electricity consumption for public lighting has decreased by about 2 percent between 2010 and 2014–16. In Kazakhstan, where the GEF supported the Law on Energy Saving and Energy Efficiency Improvements, the government allocated \$62 million to improve energy efficiency in residential buildings from 2011 to 2014, resulting in the renovation of heating systems in 1,000 residential buildings.

Strengthening policy and regulatory environments takes time, however, and the terminal evaluation review indicated that at the time of project closure, some projects had not yet succeeded in

enacting the regulatory changes that they helped develop. For example, GEF renewable energy projects in Chad (GEF ID 3959) and Palau (GEF ID 3092) developed draft bills that had not yet been passed by legislatures there at the time of the terminal evaluation. In Tunisia, the GEF provided a feed-in tariff mechanism for wind energy, but that mechanism had not yet been passed as a decree at the time of terminal evaluation. Overambitious project timelines and a lack of commitment from the government were commonly cited contributing factors.

When projects have been successful in implementing regulatory changes earlier in the project lifetime, more direct impact has been achieved. For example, in Uzbekistan, the speedy enactment

BOX 5.1 Case study examples: Multipronged approaches to energy efficiency in Thailand and Morocco

Thailand: Promoting Energy Efficiency in Commercial Buildings (PEECB) (GEF ID 4165, \$3.6 million, UNDP)

Interviews and desk review identified the following results:

- Current public procurement guidelines for the Thailand government prioritize low-cost solutions and not energy efficiency. The PEECB project developed recommendations for integrating energy efficiency into procurement criteria. Currently, the government procurement office has accepted the recommendations and has agreed to include energy efficiency in its procurement criteria. As a next step, the Ministry of Energy, Department of Alternative Energy Development and Efficiency (DEDE) will prepare a proposal for the National Energy Council led by the Prime Minister for potential wider adoption of this approach.
- DEDE officials noted that they have programs that offer direct incentives/subsidies for energy-efficient equipment procurement in the commercial sector, but not technical support for decision making. Consequently, take-up of these incentives has been low. The PEECB project addressed this gap by conducting energy efficiency demonstration projects with commercial businesses to illustrate the benefit and increase confidence in investing in energy efficiency improvements. A private sector stakeholder involved in the project noted that it plans to implement lessons learned within its broader portfolio, including an industrial estate in the Rayong province, a convention center being built in Khon Kaen province, and a hotel chain.
- The PEECB project developed 11 training modules that were delivered to more than 1,000 professionals (architects, engineers, building owners, government officials). DEDE officials noted that these training modules were “exactly what we want,” and will be owned by the Bureau of Energy Human Resources Development, which is responsible for training.

Morocco: Energy Efficiency Codes in Residential Buildings and EE Improvement in Commercial and Hospital Buildings in Morocco (GEF ID 2554, \$3.0 million, UNDP)

This project’s capacity building, training and communications efforts, as well as its pilot projects, have created momentum that is continuing today.

- Stakeholders note that in 2005, Morocco did not have a national energy efficiency policy and lacked the necessary regulatory and institutional framework. The project preparatory phase was seen as key to preparing Energy Efficiency Law No. 47, and the groundwork for the building codes. Stakeholders note that the law is imprinted with the project framework in that it incorporates energy efficiency building codes, audits, and mandatory impact studies for new urban areas.
- ADEREE, the country’s energy-efficiency agency, notes that since the project was completed, it has trained more than 10 percent of the architects in Morocco (300). ADEREE believes that more architects are using the BINATE software tool that was developed by the project to check that designs are compliant with the energy-efficient building codes.
- Government officials indicate that information from the project was used to develop a nationally appropriate mitigation action: “l’Habitat” (March 2016), which aims to reduce energy consumption in the housing sector and will form a pillar of the Moroccan INDC.
- The Ministry of Housing and Urban Policies suggests that direct impacts from the project are being seen in a new program to create green cities through which the Moroccan government aims to address urbanization and rural exodus.

of groundbreaking changes to the national building codes enabled the project to deliver GHG emissions reductions that exceeded the project target by 20 times. In the Philippines, support for administrative reforms to promote energy efficiency lighting systems helped achieve GHG emissions reductions of 3.4 MtCO₂eq.

BUILDING THE CAPACITY AND AWARENESS OF KEY INSTITUTIONS AND STAKEHOLDERS

Most GEF projects analyzed included activities focused on public and private sector capacity building (76 and 80 percent, respectively) and reducing information barriers and supporting market change through raising awareness of key stakeholder groups (98 percent). The Achieving Reduction in GHG Emissions through Advanced Energy Efficiency Technology in Electric Motors project in India (GEF ID 3152) illustrates the importance of raising awareness in the context of market change. The GEF has played a catalytic role in stimulating the interest in copper motor rotor technology by building strong awareness and interest among motor original equipment manufacturers of the potential commercial-scale production of copper motor rotors through the construction of an Enabling Technology Centre. The facility was used to fabricate the parts and provide a conduit to enable visiting motor manufacturers to learn about the product and its energy- and cost-saving attributes.⁶ The GEF's experience in demonstrating market-based approaches and financial models—as discussed below—further highlights the critical importance of such technical and institutional capacity

⁶In all, 427 copper die-cast rotors were produced for 10 original equipment manufacturers, with another 12 original equipment manufacturers wanting to have copper motor rotors produced.

building, particularly as the portfolio shifts in GEF-6 toward more financial mechanisms.

PILOTING/DEMONSTRATING MITIGATION TECHNOLOGIES

GEF climate change projects have frequently piloted or demonstrated new technologies. More than 60 percent of the projects analyzed piloted specific renewable energy, energy efficiency, or sustainable transport technologies. The ultimate success of such demonstration activities often depends on a designing a clear strategy for scaling-up early in the project, as well as complementary project components.

DEMONSTRATING MARKET-BASED APPROACHES AND FINANCIAL MECHANISMS

Thirty percent of projects analyzed demonstrated financing models or market-based approaches for renewable energy or energy efficiency. The availability of affordable, local financing is a precondition for uptake of climate mitigation technologies and remains a key barrier in developing countries. With two-thirds of the GEF-6 climate portfolio demonstrating financial mechanisms, the lessons learned from these approaches are highly relevant.

Most of the renewable energy projects reviewed worked with financial intermediaries (primarily national and regional banks and development finance institutions) to integrate renewable energy project development and lending strategies into their portfolios. These projects also demonstrate the importance of robust barrier assessment and technical capacity building. The Accelerating Renewable Energy Investments through CABEL [Central American Bank for Economic Integration] in Central America project (GEF ID 975) worked over a nearly 10-year period (2007–16) to develop a small-scale renewable energy pipeline in CABEL's

lending portfolio, develop a GEF-funded partial risk guarantee facility, enhance the participation of national lenders, and build capacity in renewable energy project evaluation and design of appropriate financial packages for small and medium-size renewable energy projects. The project was successful in issuing 12 partial risk guarantees that leveraged over \$21 million and in catalyzing 52 MW in small and medium-size renewable energy projects of over \$144 million. A key lesson learned was that the partial risk guarantee mechanism was not sufficient by itself to mitigate the barrier associated with the high level of guarantees that commercial banks had been demanding to provide financing to small and medium-size renewable energy projects; complementary technical assistance was instrumental for the international finance institutions to develop feasibility studies and/or final designs of eligible small and medium-size renewable energy projects and allow the projects to reach financial closing.

The Sustainable Energy Program in Macedonia (GEF ID 2531) offers similar lessons. The original project design included both loan and guarantee sustainable energy finance facilities, but three years into the project, only two small operations had been financed, due to lack of technical assistance beyond the pipeline of projects developed at appraisal, a lack of interest in the guarantee component given the absence of the market for this product, and a lack of government ownership. The restructuring dropped the guarantee facility and provided additional resources for extensive technical assistance and training support to participating banks. As a result, the loan facility financed two solar photovoltaic plants, including the first large renewable energy project through the 1 MW mega solar plant. However, at closure, the facility had yet to demonstrate a wide-ranging appeal to renewable energy developers, and concerns about the extent of government commitment

suggested a risk that the facility would not finance further projects despite available funds, market demand, and institutional capacity.

A review of closed energy efficiency projects echoes the lessons of the renewable energy portfolio. Though successful in catalyzing investment (e.g., the China Utility Based Energy Efficiency Program had loans totaling \$783 million, with 178 energy efficiency/renewable energy projects financed), the projects reviewed highlighted the fact that financial mechanisms, whether they be grants, guarantees or risk sharing, were not sufficient to develop an energy efficiency market.⁷ In countries that are subject to limited energy efficiency awareness, low technical capacity, and a lack of trust among key stakeholders (energy service companies, banks, industrial companies), capacity building (awareness, coordination, and training) was a critical complementary requirement. GEF energy efficiency projects analyzed utilized a range of mechanisms, including a risk-sharing facility, a subsidy and partial guarantee fund to support direct investment and bank loans for energy efficiency, respectively, and partial credit guarantees for loans to electric cooperatives.

ENGAGING THE PRIVATE SECTOR

The climate change focal area has been the most engaged of all the focal areas with the private sector. Sixty-eight percent of the projects in the private sector portfolio⁸ are in the climate

⁷For example, in the China Utility Based Energy Efficiency Program, the risk-sharing facility alone did not convince participating financial institutions to increase risk tolerance.

⁸As defined by the GEF IEO's recent Evaluation of GEF Engagement with the Private Sector (GEF IEO 2017a). The private sector portfolio is broadly interpreted to include projects that extend from engagement with

change focal area, amounting to 62 percent of the GEF's total investment in private sector. Climate change projects have also accounted for 73 percent of nongrant projects, though in GEF-6, the nongrant portfolio has further diversified, with climate change representing only 40 percent to date. The climate change focal area has also been more successful in mainstreaming private sector engagement in GEF projects: The terminal evaluation review found that 80 percent of closed projects included activities focused on building the capacity of the private sector, and a third of projects also provided direct assistance to support industry partners (e.g., for piloting technologies).

In addition, private sector entities have provided a significant amount of cofinancing for climate change projects compared to other focal areas. From the pilot phase through GEF-5, private sector entities accounted for 23 percent of total cofinancing (indicated at time of project approval or endorsement) to the GEF climate change focal area. This percentage has significantly increased in GEF-6, up to 42 percent of total cofinancing. More than half of all CCM FSPs and MSPs have had private sector cofinancing.

GEF strategies for engaging the private sector in the climate change focal area have varied widely, depending on the type of private actor being targeted (e.g., financial institutions, industry). Approaches have included the use of nongrant instruments (loans, guarantees and risk mitigation, and equity investment), engaging industry as service providers to help develop markets, supporting policy and regulatory change to promote market reform (as discussed above), strengthening public and private sector capacity (also discussed above), and providing advisory

capital providers and financial intermediaries to direct financing for enterprises to regulatory changes in support of environmentally friendly market reforms.

services, such as to support small and medium enterprise innovation and entrepreneurship through the UNIDO Global Cleantech Programme, among others. In the terminal evaluations review, the GEF's private sector engagement was largely upstream and public-sector focused—i.e., aimed at creating the supportive conditions that encourage private investment—through making policy and regulatory environments more certain and consistent, strengthening both government and private sector capacity, and demonstrating the viability of technologies and financing approaches to encourage and de-risk private sector engagement.

The GEF IEO's Evaluation of GEF Engagement with the Private Sector found that the GEF has played an important role in demonstrating private sector viability in nascent climate-related markets through its ability to tolerate higher levels of risk (GEF IEO 2017a). But more complex financial structures are relatively untested for the GEF. The evaluation suggested that the GEF may find that its resources are best deployed to explicitly enable, support, and prepare the pipeline and investment climate—taking on early-stage risk—for other more established climate finance institutions such as the CIF (particularly the CTF) and GCF.

Several interviewees for this study noted the constraints the GEF faces in supporting larger projects and programs due to its allocation system—and the disincentives the low volume resources sometimes present for attracting private sector partners. This point is also raised by the GEF IEO's private sector evaluation (GEF IEO 2017a) and the World Resources Institute's recent report *The Future of the Funds* (Amerasinghe et al. 2017). Private sector set-asides have been one tool to address this issue. At the same time, interviewees also emphasized the important role small GEF grants can play in bigger private sector operations, providing critical technical assistance and funding for innovative components that finance ministries

may not be willing to otherwise include. Aligning business models and coordinating approval cycles of the GEF with the multilateral banks was also raised during interviews as a challenge for GEF blended finance operations—an instrument that is seen as a powerful tool for engaging the private sector and leveraging cofinancing.

5.4 Case studies: operational lessons learned

The terminal evaluation review identified several commonly cited operational lessons learned. This review was complemented with in-depth review of GEF projects in two countries—Morocco and Thailand—through both desk analysis and fieldwork/interviews, which further confirmed the observations from the terminal evaluation review. The projects reviewed are provided in [annex A](#), and the stakeholders consulted during fieldwork in Morocco and Thailand are listed in [annex B](#).

IMPORTANCE OF PROJECT PREPARATION

A robust project preparatory phase is essential to the success of a project, including consultations with key stakeholders and analytical groundwork. The project preparatory phase for Promoting Energy Efficiency in Commercial Buildings (GEF ID 4165) in Thailand included consultations with building practitioners (architects and building designers), owners, managers, and government that identified the main barriers for each stakeholder and the activities required to address them; this institutional capacity and technical gap analysis was seen by the government as a key success factor. The design of the Chiang Mai Sustainable Urban Transport Project (GEF ID 4210) evolved through continuing dialogue between the World Bank and officials from the Chiang Mai Municipality. The success of the project design in capturing the specific interests and needs of the beneficiary

is observed through the continuing impacts of the project after completion and the continued ownership of the municipality to undertake recommended measures in the integrated urban transport plan. In China, the GEF–World Bank–China Urban Transport Partnership Program (GEF ID 2609) had a sound analytical grounding in a World Bank working paper that identified the institutional and policy challenges in China’s urban transport sector and proposed a clear set of near-term strategic priorities to fill these gaps.

In Morocco, the success of the building codes component of the Energy Efficiency Codes in Residential Buildings and EE Improvement in Commercial and Hospital Buildings in Morocco project (GEF ID 2554) was attributed to the extensive groundwork undertaken before the project was initiated and cited as a good model by interviewees. UNDP conducted a preparatory assistance phase (2006–09), which involved meetings, workshops, and surveys with a broad stakeholder base to enhance coordination, obtain inputs, raise awareness, and communicate the benefits of energy efficiency. The discussions with participating ministries and the Center for the Development of Renewable Energy (CDER) identified a lack of institutional mandate regarding energy efficiency. As such, these discussions led to a consensus decision that CDER should assume the lead role in driving the Energy Efficiency Building Code program. Furthermore, in response to initial discussions between the project team, the World Bank and government representatives, the Ministry of Energy launched a structural reform program for the energy sector with technical assistance from the World Bank. This reform process resulted in the Energy Efficiency Law No. 47-09 (which provides the legal basis for defining and imposing energy efficiency building standards), and the law reorganizing CDER (now ADEREE) to include energy efficiency among its

responsibilities. The former was an important achievement as it provided the legal basis for the implementing decrees and energy efficiency standards that were developed in the project. In contrast, the hospital and hotel components of the same project in Morocco were not successful, and stakeholders associated shortcomings with insufficient preparatory work with the Ministries of Health and Tourism, and a lack of effective coordination between the different partners.

The project Promoting Small Biomass Power Plants in Rural Thailand for Sustainable Renewable Energy Management and Community Involvement (GEF ID 4184) suffered due to poor assumptions and an incomplete assessment of project risks in its preparatory phase feasibility study. For example, the 250 kW community-based biomass gasification power plant was reliant on the availability and pricing of biomass, as well as a feeder to connect the consumer/load end with a substation. By 2014, the lack of biomass, price increases, and a feeder in the Na Poon subdistrict led to its abrupt relocation to the Wiang Ta subdistrict. However, the lack of sufficient preplanning led to new problems, when the project was affected by a town planning regulation (under the Ministry of Interior) that classified the Wiang Ta subdistrict as a green area, where power plant construction and operation was not allowed. The gasification power plant has been on hold since 2015. Additionally, feasibility study cost assumptions for biomass feedstock and maintenance of the 250 kW biomass gasification unit were incorrect. This led to unrealistic expectations for cost effectiveness and financial sustainability. Some of these issues were identified at the GEF approval stage review.

Similarly, though the feasibility study for the Promoting Renewable Energy in Mae Hong Son Province project (GEF ID 3359) identified general legal risks associated with microhydropower

development, because the specific project location was not identified, local complexities were not included in the project design. Interviewees suggested that if a site had been identified, consultations with local stakeholders at feasibility study stage would have identified the forestry laws (under the Department of National Parks) that have subsequently curtailed issuance of the necessary permits and approvals from central government. As such, the project has not been able to implement off-grid microhydropower generation, and some of the global environmental benefits of the project will not be achieved. Similarly, the lack of local insight at project preparatory phase meant that the financial mechanisms recommended in the project design were inappropriate and unworkable for the communities identified during project implementation. As such, increased investment, availability of microcredit, and village revenues from renewable energy systems was not achieved.

NEED FOR REVIEWING PROJECT DESIGN BEFORE IMPLEMENTATION

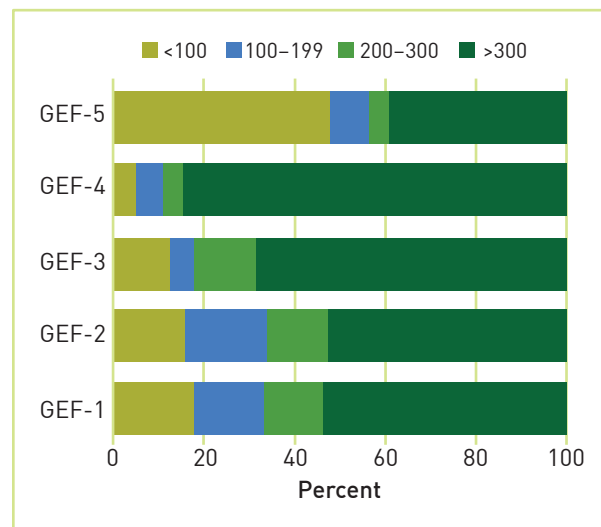
Due to extensive delays, some projects would have benefited from a review of their project designs to confirm that they were still relevant and valid. A time lag between the project preparatory phase and implementation of several years—as it has been for some projects—can create challenges if knowledge and assumptions related to the current market, regulations, and project context are not confirmed. The terminal evaluation review found that some projects have faced difficulties that could potentially have been avoided if the ongoing validity of the project context was challenged and the project was adjusted in turn; similar lessons learned emerged from the terminal evaluations of the International Finance Corporation Earth Fund projects. For example, Support to Sustainable Transportation System in the City of Belgrade

(GEF ID 3759) was implemented three years after it was designed, and many of the proposed activities were already being implemented, leading to less influence and impact than originally planned. As another example, in Promoting Small Biomass Power Plants in Rural Thailand for Sustainable Renewable Energy Management and Community Involvement (GEF ID 4184), biomass availability and pricing assumptions changed during the four-year gap between project preparatory phase and implementation, though these were not reflected in the project design at implementation. The 1 MW biomass gasification power plants have been on hold since 2015, when a new regulation for renewable energy power plants was announced by the Energy Regulatory Commission. As of May 2017, the regulation is still under development and is expected to include feed-in tariffs, which directly impact the potential cost effectiveness of the 1 MW plant. Consequently, until the regulation is finalized, construction of the plant is on hold. In Chad, the SPWA-CC: Promoting Renewable Energy Based Mini-Grid for Rural Electrification and Productive Uses project (GEF ID 3959) faced errors in baseline information, which could have been better studied and considered in project design.

A review of the time elapsed from project design to actual start dates was conducted to assess the extent of this time-lag issue. Seventy-three percent of FSPs took more than 18 months from PIF approval to Chief Executive Officer endorsement⁹ and the majority of projects approved in GEF-1 through GEF-4 took more than 300 days to move from project approval to actual start of project implementation, as shown in figure 5.5.

⁹ PIF approval dates and Chief Executive Officer endorsement dates were only available in the PMIS for a small number of CCM projects ($n = 233$).

FIGURE 5.5 Distribution of time elapsed from project approval to actual start date (days)



SOURCES: GEF IEO terminal evaluation review data set and GEF PMIS.

STRONG MULTISTAKEHOLDER ENGAGEMENTS SUPPORT RISK MANAGEMENT

Strong multistakeholder engagement and project management leadership has supported effective identification and management of risks. For example, within the Thai Ministry of Environment's Department of Alternative Energy Development and Efficiency (DEDE), three bureaus work on energy regulation and conservation, technology transfer and dissemination, and human resource development. DEDE officials noted that there typically is limited interaction between the three distinct but related areas. However, DEDE stakeholders believe that the project management unit of the UNDP Promoting Energy Efficiency in Commercial Buildings project provided an effective framework for the integration of the bureaus and the alignment of ideas and approaches. This was built on weekly meetings that all departments attended. DEDE officials noted that the number of meetings was high, and not typical of project engagements; however, it supported

close collaboration, a greater awareness of the interlinkages between outputs, and ensured that any issues were “owned” and resolved by the relevant bureaus. UNIDO’s Cleantech Programme for SMEs [small and medium-size enterprises] in Thailand (GEF ID 5800) has a workforce committee that comprises of officials from the Department of Industrial Promotion, the National Science and Technology Development Agency, the National Science Technology and Innovation Policy Office, and Kasetsart University. The workforce committee meets once per month with the main goal to follow up on and monitor the progress of the project activities. In addition, the project has a steering committee, which is chaired by Department of Industrial Promotion, under the Ministry of Industry, and provides strategic guidance and supervision during project implementation. The project was modeled on the U.S. Cleantech Open program. Though it has been adapted to the national context, the lack of prior experience of clean technology schemes in Thailand has meant numerous teething problems during its first year of operation.¹⁰ Government officials note that the ability of the project to quickly adapt and address lessons learned is due to the successful collaboration of stakeholders on the work force and the project steering committee.

In the Chiang Mai Sustainable Urban Transport Project (GEF ID 4210), local resistance to the project was initially high. However, interviews with World Bank and Chiang Mai Municipality officials indicate that three public consultations were key to building trust, educating locals, and learning their viewpoints. The project design was adapted to accommodate these learnings.

¹⁰ Cabinet approval of project implementation on January 12, 2017; collaboration agreement between UNIDO and the Department of Industrial Promotion signed on March 14, 2017.

The Industrial Energy Efficiency Project in Thailand (GEF ID 3786) benefited from strong engagement and leadership by national partners: the National Science and Technology Development Agency’s Department of Industrial Promotion, Ministry of Energy’s DEDE, and the Thai Industrial Standards Institute. National partners were responsible for different components of the project (e.g., the Department of Industrial Promotion handled Component 2, Industrial Energy Systems Optimization) and formed a working group that had regular meetings to update each other and solve problems. Interviewees indicated that this management structure helped the project run smoothly, by ensuring project components were integrated at an operational level. Furthermore, having the correct national partner reduced project start-up risks. For example, the Department of Industrial Promotion has strong connections with industry; consequently, its involvement was viewed as a credible stamp of approval for the project. This was important in identifying and convincing factories to undertake systems optimization.

5.5 Key trends in performance

To assess trends in performance in the GEF climate change focal area, this study analyzed ratings for 278 completed CCM projects with terminal evaluation reports submitted to the GEF IEO, representing \$1.4 billion in GEF funding and \$13.8 billion in realized cofinancing. GEF-3 projects represent the largest share of completed projects (33 percent), followed by GEF-2 projects (30 percent), GEF-4 projects (20 percent), GEF-1 projects (10 percent), and pilot phase projects (7 percent). By mitigation technology focus, these projects are dominated by renewable energy projects (42 percent) and energy efficiency projects (33 percent), with the remainder comprised of transportation, methane capture, forestry/land

use, mixed, and other themed projects. Figure 5.6 shows the proportion of projects by energy efficiency and renewable energy technology focus.

Overall, the performance of completed GEF CCM projects is comparable to or higher than project performance across all GEF focal areas.

OUTCOME ACHIEVEMENT

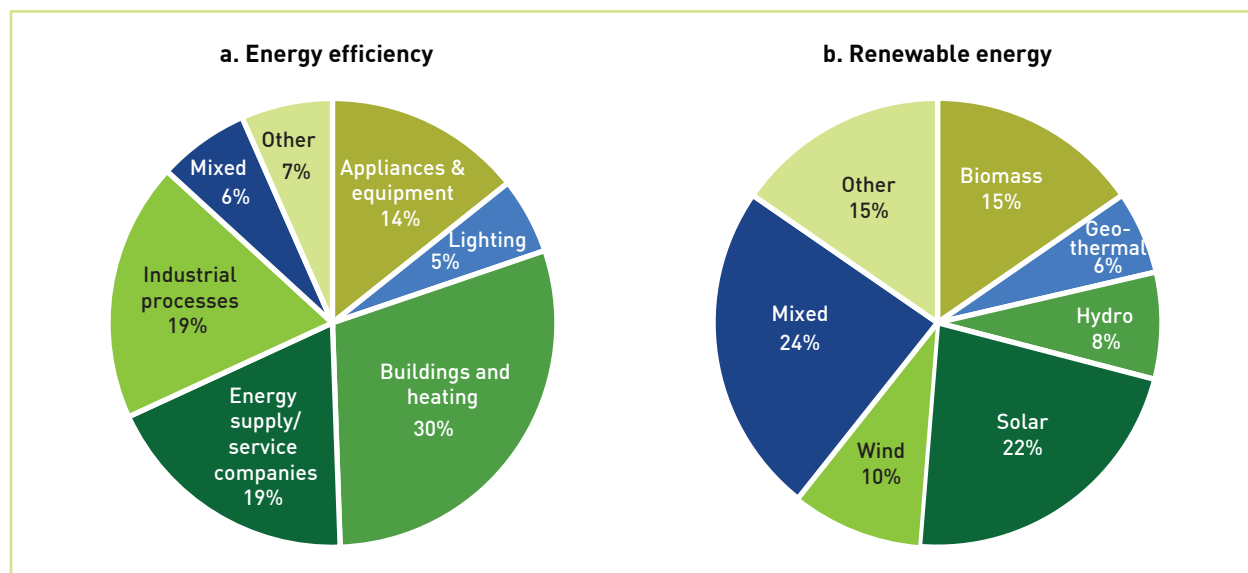
Approximately 77 percent of completed projects (accounting for 77 percent of GEF funding) in the CCM portfolio have overall outcome ratings in the satisfactory range. This performance is comparable to ratings reported across all focal areas in the *GEF Annual Performance Report 2015* (GEF IEO 2017c) for 2015 (75 percent). Overall outcome ratings for CCM projects have steadily improved over time, showing an increasing share of satisfactory ratings for each GEF replenishment period.

By theme, projects with a forestry/land use, methane capture, and energy efficiency focus performed better on average than projects with a

renewable energy, transportation, or other focus. Of projects with an energy efficiency focus, projects focusing on appliances and equipment as well as industrial processes performed better on average than projects focusing on lighting, buildings and heating, and energy supply/energy service companies. Of projects with a renewable energy focus, hydropower and wind projects performed better on average than biomass, geothermal, and solar projects. Projects executed by NGOs, multilateral organizations, and government agencies had stronger performance on average than those executed by the private sector or foundations.

Seventy-nine percent of global projects and 86 percent of regional projects have satisfactory outcomes, compared to 77 percent of national projects. Success rates were highest in Asia and Eastern Europe and Central Asia with 82 and 81 percent of outcome ratings in the satisfactory range, respectively. Success rates were lower in Africa (68 percent) and in the Latin America and the Caribbean region (76 percent).

FIGURE 5.6 Energy efficiency and renewable energy technology focus of projects with terminal evaluations



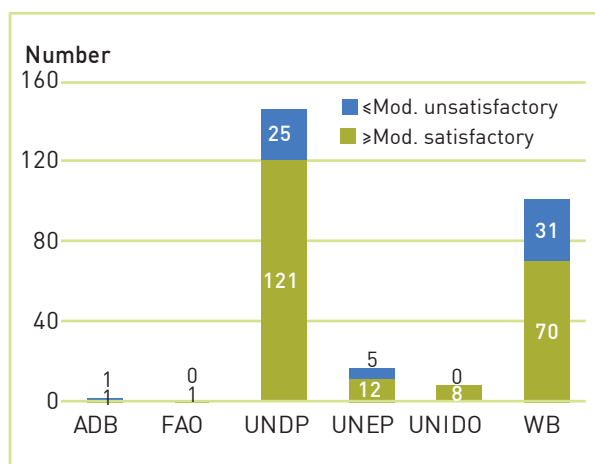
SOURCE: GEF IEO terminal evaluation review data set.

Figure 5.7 shows outcome ratings by lead implementing Agency. World Bank-led projects had a higher proportion of projects with less satisfactory outcomes than other implementing Agencies. Satisfactory outcomes for World Bank-led projects hovered around 70 percent across the GEF replenishment periods, with the highest performance in GEF-3 (73 percent satisfactory outcomes). UNDP-led projects showed steady improvement over time, reaching 84 percent of projects with satisfactory outcomes in GEF-5.

SUSTAINABILITY

Approximately 68 percent of projects for which ratings are available ($n = 265$) have sustainability ratings of moderately likely or higher, based on the likelihood of project benefits continuing past project closure. This figure is comparable to sustainability ratings across all completed GEF projects (67 percent). Overall sustainability ratings also showed general improvement over time (figure 5.8). Lower ratings were primarily driven by

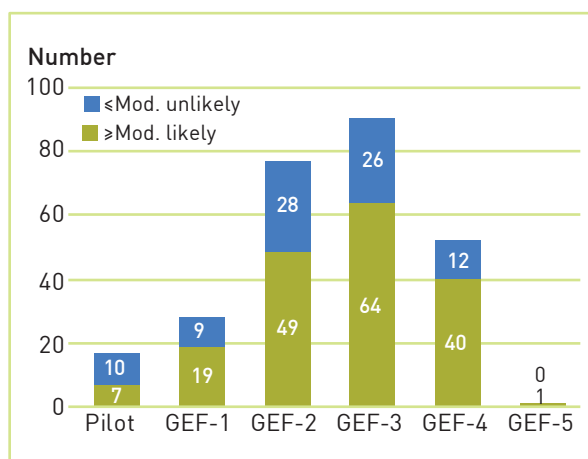
FIGURE 5.7 Project outcome ratings by GEF Agency



SOURCE: GEF IEO terminal evaluation review data set.

NOTE: ADB = Asian Development Bank; FAO = Food and Agriculture Organization of the United Nations; UNIDO = United Nations Industrial Development Organization; WB = World Bank.

FIGURE 5.8 Ratings for likelihood of project outcome sustainability by GEF replenishment period



SOURCE: GEF IEO terminal evaluation review data set.

poor ratings for the financial stability of projects; cofinancing did not fully materialize for nearly three-quarters of these projects.

Success rates were highest in Latin America and the Caribbean (78 percent), Asia (76 percent), and Eastern Europe and Central Asia (75 percent), and significantly lower in Africa (38 percent). By theme, projects with a methane capture and energy efficiency focus had higher sustainability ratings on average, while projects with transportation, renewable energy, and forestry/land use had lower sustainability ratings.

Regional projects had the highest sustainability ratings, with 76 percent rated moderately likely and above, followed by national projects (68 percent) and global projects (62 percent). Projects executed by NGOs had the highest sustainability ratings, with 80 percent rated moderately likely and above, followed by multilateral organizations (71 percent), government agencies (67 percent), and the private sector and foundations (both with 50 percent). Box 5.2 presents examples of projects with high ratings on outcomes and sustainability.

BOX 5.2 Project examples: High ratings for outcomes and sustainability

The terminal evaluation review identified the following examples of closed projects with high outcome and sustainability ratings.

- **Energy efficiency policy in Africa.** The Removal of Barriers to Energy Efficiency and Conservation in Buildings in Mauritius project (GEF ID 2241) had sustainable project achievements at the policy level, including passing a far-reaching Energy Efficiency Act into law in 2011 and helping to establish an independent Energy Efficiency Management Office under the Ministry of Energy and Public Utilities. These policy accomplishments, including establishing a feed-in tariff, helped the project exceed its GHG emissions reduction target.
- **Renewable energy development in Latin America.** The Uruguay Wind Energy Program (GEF ID 2826) made transformational contributions to positioning and developing wind power as a renewable energy source for electricity generation in Uruguay. The project was highly successful in removing the legal and regulatory barriers to wind development, as well as in building public and private sector capacities to implement such investments. Technological barriers were also overcome by operationalizing wind measuring equipment and an information management system. Installed capacity was triple the project target, with substantial GHG emissions avoided.
- **Sustainable transport in Eastern Europe.** The Gdańsk Cycling Infrastructure Project (GEF ID 1279) changed the way of thinking about cycling and cycling facilities both in Gdańsk and at the national level in Poland. The success of the project in Gdańsk motivated neighboring cities, including Sopot, Gdynia, and Tczew, to create their own cycling plans. The success of the project also led to the Gdańsk Multiyear Investment Programme, a cycling investment project with plans for construction and modernization of 130 km of cycling paths.

Across all GEF replenishment periods, Asian Development Bank and UNDP had higher shares of projects with sustainability rated moderately likely and above (100 and 70 percent, respectively). Projects implemented by UNEP, the World Bank, and UNIDO received lower overall sustainability ratings, with 65, 65, and 57 percent of projects rated moderately likely and above, respectively.

QUALITY OF IMPLEMENTATION AND EXECUTION

Seventy-seven percent of CCM projects have received quality-of-implementation ratings in the satisfactory range, with a higher percentage of projects rated in the satisfactory range for quality of execution (81 percent). This performance is higher than the ratings reported across all focal areas in GEF IEO (2017c) (72 percent). Ratings on quality of implementation have improved over the GEF replenishment periods, from 45 percent satisfactory in the pilot phase to 82 percent satisfactory in GEF-4. Ratings on quality of execution have also improved over time, from 64 percent satisfactory in the pilot phase to 82 percent satisfactory in GEF-4.

Transportation projects had lower quality of implementation (56 percent satisfactory) and quality of execution ratings (61 percent satisfactory). Projects with a combined energy efficiency/renewable energy focus and projects with a forestry/land use focus had the highest quality-of-execution ratings (100 percent satisfactory).

Seventy-one percent of regional projects are rated moderately satisfactory or higher for implementation, compared with 77 percent for national projects and 92 percent for global projects. Overall, quality of implementation has been higher in Latin America and the Caribbean (86 percent satisfactory) and lower in Africa (57 percent) and Europe and Central Asia (78 percent). Projects executed

by the private sector ($n = 5$) and foundations ($n = 4$) had 100 percent of projects rated satisfactory for quality of implementation, and projects executed by NGOs ($n = 12$) had slightly higher ratings (92 percent satisfactory) than government ($n = 172$) and multilateral Agencies ($n = 27$) (74 and 85 percent satisfactory, respectively).

MONITORING AND EVALUATION DESIGN AND IMPLEMENTATION

Sixty-three percent of CCM projects received quality of monitoring and evaluation (M&E) design ratings in the satisfactory range, with a slightly higher percentage of projects (68 percent) rated in the satisfactory range for quality of M&E implementation. This performance is higher than ratings reported across all focal areas in GEF IEO (2017c). Performance on M&E design and implementation has generally improved over time; in GEF-4, 67 and 69 percent of projects received satisfactory ratings for quality of M&E design and implementation, respectively. On average, projects with a transportation and forestry/land use focus were rated significantly lower than other types of projects on M&E design and implementation quality (35 percent and below). Energy efficiency projects had the highest ratings for M&E design, while methane capture projects had the highest ratings for M&E implementation.

By GEF Agency, cumulatively since the pilot phase, UNEP and the World Bank had the highest proportion of projects with shortcomings in M&E design quality, with 41 and 57 percent of projects scored in the satisfactory range, respectively. UNEP and the World Bank also had the highest proportion of projects with shortcomings in M&E implementation quality, with 29 and 65 percent of projects scored in the satisfactory range, respectively. By executing agency type, multilateral Agencies were rated the lowest on average (57 percent satisfactory) for M&E design quality, while the private sector was

rated the lowest on average (40 percent satisfactory) for M&E implementation quality.

COFINANCING

Cofinancing fully materialized in 49 percent of the 278 completed CCM projects with terminal evaluations. This is slightly lower than the GEF 2015 annual performance report cohort, where cofinancing requirements were met for 54 percent of projects. The average ratio of actual cofinancing to promised cofinancing across the entire portfolio of completed CCM projects was 1.14,¹¹ while the median project ratio of actual cofinancing to promised cofinancing was 0.99.¹² The median project ratio of promised cofinancing to GEF grant and median project ratio of realized cofinancing to GEF grant were 2.40 and 1.74, respectively. This performance is slightly higher than the GEF 2015 annual performance report cohort, where the median project ratio of promised cofinancing to GEF grant and median project ratio of realized cofinancing to GEF grant were both 1.6. The total amount of actual cofinancing realized per dollar of approved GEF grant for the 278 completed CCM projects was 9.69, which is also higher than the GEF 2015 annual performance report cohort (5.6).

¹¹ Figure represents \$13.831 billion in actual cofinancing divided by \$12.151 billion in planned cofinancing (or cofinancing at appraisal). A value equal to 1.0 means the amount of planned cofinancing was fully realized; a value less than 1.0 means the amount of planned cofinancing was *not* fully realized; and a value greater than 1.0 means more cofinancing was realized than planned at project appraisal.

¹² Figure represents the median value of actual cofinancing divided by planned cofinancing (or cofinancing at appraisal) across all projects. A value equal to 1.0 means the amount of planned cofinancing was fully realized; a value less than 1.0 means the amount of planned cofinancing was *not* fully realized; and a value greater than 1.0 means more cofinancing was realized than planned at project appraisal.

6: Climate change adaptation impact, results, and effectiveness

This chapter focuses on the achievements of the LDCF and SCCF financial mechanisms that are managed by the GEF, as analyzed in recent evaluations of those funds by the GEF IEO (GEF IEO 2016, 2018c).

6.1 Impacts and potential for global environment benefits

Nearly all LDCF and SCCF projects have a high to very high probability of delivering tangible adaptation benefits. To reach this conclusion, the evaluations estimated the probability that projects would effectively deliver tangible adaptation benefits based on the percentage of projects for which adaptation benefits were clearly described, realistic in the country's context, and explained in terms of measurable results. Nearly all LDCF and SCCF projects were found to have clearly defined adaptation benefits and the majority had adaptation benefits that were realistic in the context of projects' countries. However, fewer LDCF and SCCF projects had adaptation benefits explained in terms of measurable results (85 percent and 73 percent, respectively). The LDCF evaluation found that 90 percent of projects took into account potential major risks and included sufficient risk mitigation measures. The SCCF evaluation found that only 72 percent of projects undertook sufficient risk analysis and 87 percent of projects had mitigation strategies that adequately addressed all or most of the identified risks.

With regard to global environmental benefits, both LDCF and SCCF projects are expected to have limited impact. The greatest global environmental benefit contribution of the funds is expected to be toward sustainable land management in production systems, with approximately one-third of all fund projects contributing to this benefit to some extent. In addition, approximately 18 percent of LDCF and 10 percent of SCCF projects are expected to contribute to maintaining globally significant biodiversity; 11 percent of LDCF projects are expected to contribute to enhancing the capacity of countries to implement and mainstream multilateral environmental agreements; and nearly 10 percent of SCCF projects are expected to contribute to transformational shifts toward low-emissions and resilient development paths.

6.2 Catalytic effects of funds

Both the LDCF and SCCF evaluations analyzed projects against a broadly linear sequence of four catalytic effects that influential projects could be expected to follow: production of a public good, demonstration, replication, and scaling-up. Virtually all projects were found to have achieved the first two effects on the catalytic chain—namely production of a public good and demonstration—but were less successful in the latter two catalytic steps. Nearly 80 percent of LDCF projects and 93 percent of SCCF projects developed or introduced new public technologies or approaches to a large or extremely large extent. In addition,

nearly 70 percent of all fund projects were used as demonstrations to further catalyze the newly produced public goods; approximately half of all fund projects were replicated within or outside projects; and approximately 15 percent of LDCF projects and one-third of SCCF projects were scaled-up on a regional or national scale to a large or extremely large extent.

The evaluations also incorporated stakeholder views on what constituted catalytic effects of completed projects, specifically focused on indicators of momentum and synergy generated by fund support. Stakeholders noted that completed LDCF and SCCF projects were catalytic in generating social, economic, cultural, and human well-being cobenefits. In addition, stakeholders noted that the LDCF projects were catalytic in building foundations for large-scale projects and impacting multiple sectors and different levels of society. Meanwhile, SCCF projects were noted as catalytic in improving management effectiveness of (sub-)national systems and in building on traditional knowledge and practices.

6.3 Sustainability of funds

The LDCF program evaluation assessed 11 completed projects and the SCCF program evaluation assessed 13 completed projects for which terminal evaluation review ratings were available. These evaluations determined that 8 out of 11 and 10 out of 13 projects assessed were moderately likely or likely to achieve sustainable outcomes. Concerns with sustainability raised in the LDCF evaluation included a lack of assured financing in future phases of project implementation as well as concerns with institutional and sociopolitical sustainability. Similarly, the SCCF evaluation emphasized that the strength of national frameworks and institutions, as well as the extent of financial and human resources available to continue to support the projects post-implementation,

affected determinations of sustainability. In addition, the SCCF evaluation noted that projects with sustainability-focused planning integrated into the original project design and projects grounded within existing local contexts, including technologies, institutions, and practices, were more likely to achieve sustainability. While 75 percent of assessed projects were moderately likely to likely to achieve longer-term sustainability, it should be noted that a review of 24 completed LDCF/SCCF projects is perhaps not significant enough to draw conclusions on the sustainability of these funds in their entirety.

6.4 Fund efficiency

Both LDCF and SCCF projects were noted in the evaluations as experiencing delays; more than 20 percent of the LDCF and more than 35 percent of the SCCF projects (excluding canceled projects) experienced delays during their approval and implementation processes. However, the funds have been reducing these delays in the most recent GEF cycles; three-quarters of the delays noted in the LDCF portfolio occurred during GEF-4 and measures have been taken to expedite the project cycle in GEF-5. In addition, the proposal development, feedback, and approval processes in the SCCF were regarded positively by interviewees as more efficient and cost-effective than comparable funds.

Limited resources and resource unpredictability were factors consistently raised by interviewees as negatively impacting funds' efficiency. Despite an increase in contributions over time for both the LDCF and SCCF, demand for funding consistently exceeds the cumulative pledges. For instance, in the period between October 2014 and April 2015, the available SCCF funds met just over 10 percent of the demand. Since that time, only \$2.29 million in additional pledges have been received, significantly less than the \$100 to \$125 million required.

Similarly, in May 2014, the GEF Secretariat reported that there were no resources available for new LDCF approvals and that there was a deficit of \$66.32 million for existing proposals.

This lack and unpredictability of funding leads to reluctance among GEF Agencies to develop or encourage SCCF project proposals. The SCCF evaluation noted that some Agencies in fact confirmed that they had entirely stopped considering or promoting the SCCF as funding source due to the large amount of time, financial, and political capital required to develop and build support for proposals, and the high risk of unavailable funding. This trend has also created problems when funding has become available, as Agencies are

less likely to have well-developed project proposals. In addition, the unpredictability of LDCF funds was found to delay project preparation, approvals, and implementation. It has also changed stakeholders' perceptions of the fund's transparency, which has been shown to be a significant challenge for countries dependent on LDCF financing for implementation of key adaptation priorities as set out in their respective national adaptation programs of action. To reduce the negative impacts of limited resources and resource unpredictability, the primary recommendation from both the LDCF and SCCF evaluations was for the GEF Secretariat to prioritize the development of mechanisms to ensure predictable, adequate, and sustainable financing for the Funds.

7: Conclusions and recommendations

7.1 Conclusions

This study has provided the first comprehensive look at the relevance, results, effectiveness, and lessons learned of the GEF's activities in the climate change focal area since 2004—and reached the following seven conclusions.

Conclusion 1: GEF climate change support has been highly relevant to UNFCCC guidance and continues to be relevant. The study confirmed that the GEF-6 Climate Change Focal Area Strategy is responsive to guidance from the UNFCCC, and that the GEF-6 climate change portfolio is well aligned with UNFCCC guidance and the GEF CCM objectives. GEF climate adaptation activities—through the LDCF and SCCF—are, for the most part, also highly relevant to UNFCCC guidance and decisions. The coherence of GEF support for climate change programming with the guidance and priorities of the UNFCCC has been recognized in other recent evaluations, including the Fifth Review of the Financial Mechanism (UNFCCC Standing Committee on Finance 2014). The GEF has also been notably responsive to COP guidance issued after the finalization of the GEF-6 Strategy. In particular, the new CBIT Trust Fund was established just one year after the request from COP-21, and projects have already been PIF-approved.

The GEF's continuing relevance was further confirmed by the international community in late 2015, when the GEF, along with the GCF, was requested

to serve as financial mechanism for the Paris Agreement. The GEF has also demonstrated its continuing relevance to other major international climate and development initiatives of relevance to the climate change focal area, such as the SDGs and the United Nations' SE4All initiative, as evidenced by programmed resources for GEF-6.

Conclusion 2: GEF's climate change portfolio offers clear comparative advantages within the global climate finance landscape, but there is a need to further articulate and promote these.

The GEF's distinguishing features include its flexible grant financing; its focus on the enabling environment to support scaled-up climate investment; its emphasis on demonstrating technologies and financial approaches, including innovative and risk-sharing approaches; its ability to fund integrated projects across environmental issues; its experience; and its support to help countries meet their UNFCCC obligations. External analyses and key stakeholder interviews have identified potential niches for the GEF in focusing on upstream activities to develop supportive conditions for broader climate investment (e.g., through policy work and capacity building), as well as piloting innovative and riskier approaches that, if successful, could be taken up by other funds, such as the GCF.

Conclusion 3: Most GEF climate change projects have shown some evidence of catalytic effects. The most common catalytic effect was

mainstreaming (primarily through policy or regulatory reform) and the least common was scaling-up. In the climate change focal area, the terminal evaluation review found that about 70 percent of projects analyzed showed evidence of progress toward impact through mainstreaming, which takes place when information, lessons, or specific results of GEF interventions are incorporated into broader stakeholder mandates and initiatives such as laws, policies, regulations, or programs. Performance was less strong for replication, scaling-up, and market changes (with 38, 31, and 35 percent of projects showing evidence of these effects). The closed projects analyzed frequently lacked articulated strategies to achieve these catalytic effects; many terminal evaluations also noted broader sector and economic issues—such as energy subsidies—as constraints for the broader adoption of the approaches demonstrated by GEF activities. Further to this point, a recent impact evaluation of the GEF’s mitigation portfolio in China, India, Mexico, and Russia found that projects demonstrating a high level of progress toward impact are those that have adopted comprehensive approaches to address market barriers and specifically targeted supportive policy frameworks.

The LDCF and SCCF portfolios showed similar results. Virtually all projects were found to have achieved the first two effects on the catalytic chain defined by the LDCF and SCCF evaluations—namely production of a public good and demonstration—but were less successful in replication and least successful in scaling-up. Stakeholders also noted that completed LDCF and SCCF projects were catalytic in generating social, economic, cultural, and human well-being cobenefits, and LDCF projects helped build foundations for large-scale projects.

In the climate change focal area, those projects that had scaled up or showed significant potential

to scale up frequently did so through securing follow-on funding from the GEF or other multilateral or bilateral donors, or through contributing to the development of nationally owned programs via projects that included significant MDB cofinancing. As identified above, a niche for the GEF could be to support projects that test concepts and approaches that, if successful, could be attractive for scaled-up investment by other partners, such as the GCF and the CIF.

Conclusion 4: The GEF has an important role to play in strengthening the enabling environment for scaling up public and especially private climate investment. Significant impact can be leveraged through capacity building and policy activities, as a recent impact evaluation of GEF CCM support in China, India, Mexico, and Russia found. GEF climate change projects have frequently focused on policy and regulatory reform, public and private sector capacity building, and reducing information barriers and supporting market change through raising awareness of key stakeholder groups. GEF support has been limited but critical for development of energy policies and laws in some countries, primarily in the areas of energy efficiency (e.g., certification, standards, and labeling) and renewable energy (e.g., feed-in tariffs). The GEF’s impact on policy and regulatory reform has been most visible in countries with high levels of ownership among government and other stakeholders.

This study also confirmed that technical assistance and capacity building are critical components for successful private sector engagement. The terminal evaluation review offered examples of projects piloting financial models to scale up energy efficiency and renewable energy adoption that successfully adapted to provide more intensive technical assistance and achieve sustainable impacts. The GEF IEO private sector evaluation found that nearly all projects reviewed

had technical assistance components (GEF IEO 2017a), which were almost invariably financed by the GEF, further supporting this area as one of the GEF's comparative advantages and one for which the need should not be underestimated in project design. These lessons are particularly important in the context of the increasing focus of the climate change portfolio on financial models and market-based approaches, as evidenced by GEF-6 programmed resources, as well as in the context of the climate change focal area's relatively larger private sector portfolio compared to other focal areas.

Conclusion 5: The majority of GEF projects show evidence at project closure of outcomes that should lead to GHG emissions reductions. However, a significant proportion of projects either fall short of their emissions target or estimate at closure that no emissions reductions will be achieved. Specifically, the terminal evaluation review found that 20 of 52 of projects exceeded their direct GHG emissions reduction targets; 12 projects fell short; and another 20 did not have information available to evaluate their achievement against target (17 of these estimated no direct reductions achieved). The majority of estimated emissions reductions at project closure were concentrated in a few projects and countries (primarily China), a finding that echoes that of the Technical Document 20 prepared for OPS5. These findings suggest that a sizable number of GEF projects may not be achieving their expected emissions reductions.

In addition, missing and inconsistently reported information is a limiting factor in analyzing performance against targets. To date, the GEF has not systematically tracked or reported estimated emissions reductions achieved at the time of project closure. The issue of comparability and quality of GHG impact estimation is not new for the GEF; it was raised in the 2004 GEF Climate Change Program Study (GEF IEO 2004) and more recently

by the recent Fifth Review of the Financial Mechanism (UNFCCC Standing Committee on Finance 2014), in the context of improving methodologies for measuring results and impacts. These issues were also further explored in the GEF IEO's Review of Results-Based Management in the GEF (2017d), in support of OPS6.

Conclusion 6: Quality and validity of project design and extent of stakeholder engagement influence climate change outcomes. The terminal evaluation review and in-depth country work identified several common operational lessons learned, including the importance of a robust project preparatory phase (e.g., consultations with key stakeholders and analytical groundwork); the need to review the validity of the project design and context before implementation, particularly in the event of extensive delays between project preparation and implementation; and the positive influence of strong multistakeholder engagement and project management leadership on identification and management of risks. While not new challenges, these findings highlight the perennial need for good design and management, especially in the context of fast-evolving technology and policy environments and as the GEF moves toward more complex integrated approaches.

Conclusion 7: Activities funded by other focal areas and initiatives, along with multifocal area projects, are poised to deliver significant global environmental benefits (GHG emissions reductions) that may be greater than those achieved by activities financed by the climate change focal area alone. Stand-alone projects in the climate change focal area are only a third of the total expected GHG emissions reductions from the GEF-6 portfolio. Significant contributions are also expected from sustainable forest management and other focal areas, as well as the integrated approach pilots, pushing anticipated GHG emissions reductions well above the target for GEF-6.

Climate change priorities have also increasingly been addressed through multifocal area projects. Over time, the GEF CCM portfolio has shifted away from single-sector, traditional technology demonstration projects and toward more multifaceted projects with holistic approaches, offering unique value for CCM efforts moving forward. More than 40 percent of approved projects in GEF-6 seek to enhance synergies across focal areas, mostly through integrated urban management and mitigation-adaptation activities. The proportion of approved resources for multifocal area projects grew from 8 percent in GEF-4 to 35 percent in GEF-5 to 42 percent so far in GEF-6 (as a percentage of total approved CCM resources). Most multifocal area projects are tracking climate change-related indicators—even those that did not receive funding from the climate change focal area.¹

¹Eighty-seven percent of multifocal area projects that did not receive funding from the CCM focal area tracked climate change-related indicators.

7.2 Recommendations

In light of these conclusions, the GEF might consider two recommendations:

- **The GEF should place continued emphasis on its work on the enabling environment, as well as innovative projects in climate change mitigation to support market transformation.**

The GEF should continue to focus on piloting and demonstrating technologies and financial approaches that could be scaled up by others. The GEF should explore its potential to be an incubator for countries to test and refine their approaches prior to seeking large-scale financing through other partners. These are areas where the GEF has shown strong results and a comparative advantage. The GEF should also continue to emphasize innovative and cutting-edge projects in its LDCF and SCCF portfolios to advance climate change adaptation knowledge and practice.

The GEF Secretariat should take measures to ensure reporting against global environmental benefit targets. To understand what past results have been achieved, the GEF Secretariat and the Agencies should ensure post-completion reporting against global environmental benefit targets, specifically GHG emissions mitigated.

Annex A: Projects reviewed

TABLE A.1 Projects with terminal evaluations reviewed

GEF ID	Agency	Country	Project title	Theme	GEF period	GEF funding (mil. \$)
967	UNDP	Tunisia	Private Sector Led Development of On-Grid Wind Power in Tunisia	RE	GEF-3	2.00
975	UNDP	Regional	Accelerating Renewable Energy Investments through CABEL in Central America	RE	GEF-3	6.92
1116	UNDP	Armenia	Improving the Energy Efficiency of Municipal Heat and Hot Water Supply in Armenia	EE	GEF-3	2.95
1245	UNDP	Lesotho	Renewable Energy-based Rural Electrification	RE	GEF-3	2.50
1361	UNEP	Cuba	Generation and Delivery of Renewable Energy Based Modern Energy Services in Cuba; the case of Isla de la Juventud	RE	GEF-3	5.34
1532	World Bank	Philippines	Electric Cooperative System Loss Reduction Project	EE	GEF-3	12.00
1892	World Bank	China	Heat Reform and Building Energy Efficiency Project	EE	GEF-3	18.00
1894	World Bank	South Africa	Renewable Energy Market Transformation (REMT)	RE	GEF-3	6.00
2241	UNDP	Mauritius	Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings	EE	GEF-4	0.91
2374	World Bank	Vietnam	Rural Energy II	RE	GEF-3	5.25
2397	UNDP	Korea, Dem. People's Republic	Small Wind Energy Development and Promotion in Rural Areas (SWEDPRA)	RE	GEF-3	0.73
2499	UNDP	Guatemala	Productive Uses of Renewable Energy in Guatemala (PURE)	RE	GEF-3	2.55
2526	UNDP	Pakistan	Promotion of Energy Efficient Cooking, Heating and Housing Technologies (PEECH)	EE	GEF-4	0.98
2531	World Bank	Macedonia	Sustainable Energy Program	RE	GEF-3	5.50
2554	UNDP	Morocco	Energy Efficiency Codes in Residential Buildings and Energy Efficiency Improvement in Commercial and Hospital Buildings in Morocco	EE	GEF-3	3.00

GEF ID	Agency	Country	Project title	Theme	GEF period	GEF funding (mil. \$)
2567	UNDP	Palau	Sustainable Economic Development through Renewable Energy Applications (SEDREA)	RE	GEF-4	0.98
2604	UNDP	South Africa	Sustainable Public Transport and Sport: A 2010 Opportunity	ST	GEF-4	10.97
2609	World Bank	China	GEF-World Bank-China Urban Transport Partnership Program (CUTPP)	ST	GEF-4	21.00
2767	World Bank	Regional	LAC Regional Sustainable Transport and Air Quality Project	ST	GEF-3	2.90
2775	UNDP	Kenya	Development and Implementation of a Standards and Labeling Programme in Kenya with Replication in East Africa	EE	GEF-3	2.00
2777	UNDP	Regional	Barrier Removal to the Cost-Effective Development and Implementation of Energy Standards and Labeling Project (BRESL)	EE	GEF-4	7.80
2935	UNDP	Indonesia	Micro-turbine Cogeneration Technology Application Project (MCTAP)	EE	GEF-4	2.59
2952	World Bank	China	Thermal Power Efficiency	EE	GEF-4	19.70
2996	World Bank/ IFC	Sri Lanka	Portfolio Approach to Distributed Generation Opportunity (PADGO) (Phase 1)	RE	GEF-3	3.60
3010	UNDP	Mongolia	LGGE: Energy Efficiency in New Construction in the Residential and Commercial Buildings Sector in Mongolia	EE	GEF-4	0.98
3027	UNDP	Tajikistan	Support to Sustainable Transport Management in Dushanbe	ST	GEF-4	0.97
3144	UNDP	Uruguay	PROBIO - Electricity Production from Biomass in Uruguay	RE	GEF-4	1.00
3215	UNDP	Jordan	Energy Efficiency Standards and Labeling of Building Appliances	EE	GEF-4	0.97
3224	UNEP	Global	Establishing Sustainable Liquid Biofuels Production Worldwide (A Targeted Research Project)	RE	GEF-4	0.97
3257	UNDP	Bosnia-Herzegovina	Biomass Energy for Employment and Energy Security Project	RE	GEF-4	0.97
3296	World Bank	Indonesia	Geothermal Power Generation Development Program	RE	GEF-4	4.00
3425	UNDP	Kyrgyzstan	Improving Energy Efficiency in Buildings	EE	GEF-4	0.90
3433	UNDP	Slovak Republic	Sustainable Mobility in the City of Bratislava	ST	GEF-4	0.93
3565	UNDP	Turkey	Market Transformation of Energy Efficient Appliances in Turkey	EE	GEF-4	2.71
3594	UNIDO	Vietnam	CF: Promoting Industrial Energy Efficiency through System Optimization and Energy Management Standards	EE	GEF-4	0.86
3624	UNDP	Uzbekistan	Promoting Energy Efficiency in Public Buildings	EE	GEF-4	2.91

GEF ID	Agency	Country	Project title	Theme	GEF period	GEF funding (mil. \$)
3641	ADB	Regional	PAS: Promoting Energy Efficiency in the Pacific	EE	GEF-4	5.25
3672	UNDP	China	Phasing-out Incandescent Lamps & Energy Saving Lamps Promotion (PIESLAMP)	EE	GEF-4	14.00
3758	UNDP	Kazakhstan	Energy Efficient Design and Construction in Residential Sector	EE	GEF-4	4.57
3759	UNDP	Serbia	Support to Sustainable Transportation System in the City of Belgrade	ST	GEF-4	0.95
3793	UNDP	Namibia	Namibia Energy Efficiency Programme (NEEP) In Buildings	EE	GEF-4	0.86
3881	UNDP	Ghana	SPWA-CC: Promoting of Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana.	EE	GEF-4	1.72
3931	UNDP	Kyrgyz Republic	Small Hydro Power Development	RE	GEF-4	0.95
3935	UNDP	Armenia	LGGE Improving Energy Efficiency in Buildings	EE	GEF-4	1.05
3959	UNIDO	Chad	SPWA-CC: Promoting Renewable Energy Based Mini-Grids for Rural Electrification and Productive Uses	RE	GEF-4	1.76
3976	UNIDO	Cambodia	Reducing Greenhouse Gas Emissions through Improved Energy Efficiency in the Industrial Sector	EE	GEF-4	1.24
4005	UNIDO	Côte d'Ivoire	SPWA-CC: Promoting Renewable Energy-based Grids in Rural Communities for Productive Uses	RE	GEF-4	0.86
4030	UNDP	Russian Federation	Greening 2014 Sochi Olympics: A Strategy and Action Plan for the Greening Legacy	Mixed	GEF-4	0.90
4115	UNDP	Romania	LGGE Improving Energy Efficiency in Low-Income Households and Regions of Romania	EE	GEF-4	2.97
4147	UNIDO	Ecuador	Industrial Energy Efficiency in Ecuador	EE	GEF-4	0.92
4219	World Bank-IDB	Haiti	Emergency Program for Solar Power Generation and Lighting for Haiti, as a Consequence of the Earthquake in Port au Prince.	RE	GEF-4	1.00
4285	UNIDO	Burkina Faso	Promoting Energy Efficiency Technologies in Beer Brewing Sector in Burkina Faso	EE	GEF-4	0.43

SOURCE: GEF PMIS.

NOTE: Agencies: ADB = Asian Development Bank; IFC = International Finance Corporation. Themes: EE = energy efficiency; RE = renewable energy; ST = sustainable transportation.

TABLE A.2 GEF-6 projects reviewed

GEF ID	Agency	Country	Project title	GEF funding (mil. \$)
6913	UNDP	Uzbekistan	Market Transformation for Sustainable Rural Housing Project	6.00
6919	UNIDO	China	Upgrading of China SHP Capacity Project	8.93
6925	UNEP	Global	Umbrella Programme for Biennial Update Report to the United National Framework Convention on Climate Change	14.41
6930	UNDP	China	Energy Efficiency Improvement in Public Sector Buildings	8.93
6942	EBRD	Ukraine	Finance and Technology Transfer Centre for Climate Change (FINTECC)	7.00
6974	AfDB	Benin	Improving Mobility in Parakou	1.83
8004	UNEP	Global	Preparation of Intended Nationally Determined Contribution (INDC) to the 2015 Agreement under the United Nations Framework Convention on Climate Change	1.80
8024	UNEP	Global	Preparation of Intended Nationally Determined Contribution (INDC) to the 2015 Agreement under the United Nations Framework Convention on Climate Change	1.80
9040	UNDP	Comoros	Sustainable Development of Comoros Islands by Promoting the Geothermal Energy Sources	5.91
9042	UNDP	Moldova	Moldova Sustainable Green Cities : Catalyzing Investment in Sustainable Green Cities in the Republic of Moldova Using a Holistic Integrated Urban Planning Approach	2.64
9043	AfDB	Regional	Investing in Renewable Energy Project Preparation under the Sustainable Energy Fund for Africa (SEFA)(nongrant)	10.00
9047	EBRD	Regional	Green Logistics Program (nongrant)	15.00
9048	UNDP	Ethiopia	Ethiopian Urban NAMA: Creating Opportunities for Municipalities to Produce and Operationalise Solid Waste Transformation (COMPOST)	6.67
9053	UNIDO	Argentina	Reducing Argentina's Greenhouse Gas Emissions from the Energy Sector through the Utilization of Organic Waste for Energy Generation in Agriculture and Agroindustries.	6.00
9056	UNIDO	Burundi	Promotion of Small Hydro Power (SHP) for Productive Use and Energy Services	1.58
9057	UNIDO	Brazil	Biogas Applications for the Brazilian Agro-industry	7.00
9067	ADB	Cook Islands	Renewable Energy Sector Project	4.26
9081	UNDP	Turkey	Promoting Energy-Efficient Motors in Small and Medium Sized Enterprises (PEEMS)	3.75
9085	DBSA	South Africa	Equity Fund for the Small Projects Independent Power Producer Procurement Programme (SP-IPPPPP)	15.00
9087	UNEP	Global	Preparation of Intended Nationally Determined Contribution (INDC) to the 2015 Agreement under the United Nations Framework Convention on Climate Change	1.60
9105	UNEP	Global	Preparation of Intended Nationally Determined Contribution (INDC) to the 2015 Agreement under the United Nations Framework Convention on Climate Change	1.80
9112	UNDP	Regional	The Ten Island Challenge: De-risking the Transition of the Caribbean from Fossil Fuels to Renewables	1.78

GEF ID	Agency	Country	Project title	GEF funding (mil. \$)
9115	World Bank	Indonesia	IBRD Geothermal Energy Upstream Development Project	6.25
9116	AfDB	Cameroon	Promoting Access to Renewable Energy and Development of IT Tools for Rural Communities of Cameroon	1.73
9146	ADB	Lao PDR	Vientiane Sustainable Urban Transport Project	1.84
9151	UNDP	Bosnia-Herzegovina	Catalyzing Environmental Finance for Low-Carbon Urban Development	2.37
9191	UNDP	Tajikistan	Green Energy SMEs Development Project	2.52
9192	UNDP	Kazakhstan	De-risking Renewable Energy Investment	4.51
9204	UNDP	Jordan	A Systemic Approach to Sustainable Urbanization and Resource Efficiency in Greater Amman Municipality (GAM)	2.64
9210	UNDP	Uganda	NAMA on Integrated Waste Management and Biogas in Uganda	2.17
9218	UNIDO	Turkey	Sustainable Use of Biomass to Assist the Development of Turkey's Economy Towards a Low-carbon Development Path	4.42
9220	UNDP	Tuvalu	Facilitation of the Achievement of Sustainable National Energy Targets of Tuvalu (FASNETT)	2.64
9225	UNIDO	Mozambique	Towards Sustainable Energy for All in Mozambique: Promoting Market-Based Dissemination of Integrated Renewable Energy Systems for Productive Activities in Rural Areas	2.85
9226	UNIDO	China	Integrated Adoption of New Energy Vehicles in China	8.93
9251	UNDP	Samoa	Improving the Performance and Reliability of RE Power Systems in Samoa (IMPRESS)	6.08
9258	ADB-UNEP	India	Creating and Sustaining Markets for Energy Efficiency	18.86
9273	UNDP	Papua New Guinea	Facilitating Renewable Energy & Energy Efficiency Applications for Greenhouse Gas Emission Reduction (FREAGER)	2.84
9279	UNDP	Turkmenistan	Sustainable Cities: Integrated Green Urban Development in Ashgabat and Awaza	6.06
9281	UNIDO	Tanzania	Promotion of Bio-Ethanol as Alternative Clean Fuel for Cooking in the United Republic of Tanzania	2.46
9291	UNDP	Central African Republic	Promotion of Small Hydropower Based Mini-Grids for a Better Access to Modern Energy Services in Central African Republic	2.65
9292	AfDB	Liberia	Increasing Energy Access through the Promotion of Energy Efficient Appliances in Liberia	2.64
9309	UNDP	Global	The Climate Finance Aggregation for Developing Countries	1.95
9320	UNEP	Global	Increasing Investments in District Energy Systems in Cities—a SE4All Energy Efficiency Accelerator	2.00
9329	UNEP	Global	Scaling up the SE4ALL Building Efficiency Accelerator (BEA)	2.00
9342	UNDP	Serbia	Climate Smart Urban Development Challenge	1.95
9354	IDB	Colombia	Public Lighting Energy Efficiency Program: Public Lighting Replacement of Low-Efficiency VSAP Bulbs with High-Efficiency LEDs in Colombia	2.00
9355	ADB	Tonga	Outer Island Renewable Energy Project	2.64

GEF ID	Agency	Country	Project title	GEF funding (mil. \$)
9393	BOAD	Togo	Project of Hybridization of Diesel Engines of Multifunctional Platforms with Solar Systems	2.67
9423	UNIDO	Egypt	Egyptian Programme for Promoting Industrial Motor Efficiency	2.75
9452	UNEP	Global	Technology Needs Assessments-Phase III	5.40
9480	UNDP	Uruguay	Towards a Sustainable and Efficient Urban Mobility System in Uruguay	1.72
9485	UNIDO	Morocco	Programme for Cleantech Innovation and Green Jobs in Morocco	0.91
9486	UNIDO	Morocco	Greening COP22 in Marrakesh, Morocco	1.83
9567	UNDP	Morocco	Renewable Energy for the City of Marrakech's Bus Rapid Transit System	1.32
9574	UNDP	Vanuatu	Barrier Removal for Achieving the National Energy Road Map Targets of Vanuatu (BRANTV)	2.64
9640	UNIDO	Cambodia	Low-Carbon Development for Productivity and Climate Change Mitigation through the Transfer of Environmentally Sound Technology (TEST) Methodology	1.78
9652	UNEP	Costa Rica	Costa Rica's Integrated Reporting and Transparency System	1.00
9666	World Bank	Global	Urban Networking to Complement and Extend the Reach of the Sustainable Cities IAP	2.00
9673	UNEP	South Africa	Capacity Building Programme to Implement South Africa's Climate National System	1.10
9674	CI	Kenya	Strengthening National Institutions in Kenya to Meet the Transparency Requirements of the Paris Agreement and Sharing Best Practices in the East Africa Region	1.00
9675	UNEP-UNDP	Global	CBIT Global Coordination Platform	1.00

SOURCE: GEF PMIS.

NOTE: ADB = Asian Development Bank; AfDB = African Development Bank; BOAD = West African Development Bank; CI = Conservation International; DBSA = Development Bank of South Africa; EBRD = European Bank for Reconstruction and Development.

TABLE A.3 Case study projects reviewed in Thailand

GEF ID	Agency	Project title	GEF period	GEF funding (mil. \$)
3359	UNDP	Promoting Renewable Energy in Mae Hong Son Province	GEF-4	2.99
3786	UNIDO	CF: Industrial Energy Efficiency	GEF-4	3.62
4037	UNIDO	TT-Pilot (GEF-4): Overcoming Policy, Market and Technological Barriers to Support Technological Innovation and South-South Technology Transfer: The Pilot Case of Ethanol Production from Cassava	GEF-4	2.60
4165	UNDP	LGGE Promoting Energy Efficiency in Commercial Buildings in Thailand (PEECB)	GEF-4	3.64
4184	UNIDO	Promoting Small Biomass Power Plants in Rural Thailand for Sustainable Renewable Energy Management and Community Involvement	GEF-4	0.98
4210	World Bank	Sustainable Urban Transport in Chiang Mai	GEF-4	0.73
5800	UNIDO	GEF UNIDO Cleantech Programme for SMEs	GEF-5	1.83

SOURCE: GEF PMIS.

TABLE A.4 Case study projects reviewed in Morocco

GEF ID	Agency	Project title	GEF period	GEF funding (mil. \$)
647	World Bank	Integrated Solar Combined Cycle Power Plant (formerly Solar Based Thermal Power Plant)	GEF-2	43.20
2554	UNDP	Energy Efficiency Codes in Residential Buildings and Energy Efficiency Improvement in Commercial and Hospital Buildings in Morocco	GEF-3	3.00
5358	UNDP	Mainstreaming Climate Change in the National Logistics Strategy and Roll-Out of Integrated Logistics Platforms	GEF-5	2.27

SOURCE: GEF PMIS.

TABLE A.5 Additional case study projects reviewed for lessons learned

GEF ID	Agency	Country	Project title	GEF period	GEF funding (mil. \$)
Energy efficiency projects					
1532	World Bank	Philippines	Electric Cooperative System Loss Reduction Project	GEF-3	12.00
1905	World Bank	Tunisia	Development of an Energy Efficiency Program for the Industrial Sector for Tunisia		
2241	UNDP	Mauritius	Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings	GEF-4	0.91
2554	UNDP	Morocco	Energy Efficiency Codes in Residential Buildings and Energy Efficiency Improvement in Commercial and Hospital Buildings in Morocco	GEF-3	3.00
2624	World Bank	China	China Utility-Based Energy Efficiency Finance Program (CHUEE)	GEF-3	4.80
3152	UNDP	India	Achieving Reduction in GHG Emissions through Advanced Energy Efficiency Technology in Electric Motors	GEF-4	1.11
3565	UNDP	Turkey	Market Transformation of Energy Efficient Appliances in Turkey	GEF-4	2.71
3624	UNDP	Uzbekistan	Promoting Energy Efficiency in Public Buildings	GEF-4	2.91
3758	UNDP	Kazakhstan	Energy Efficient Design and Construction in Residential Sector	GEF-4	4.57
3881	UNDP	Ghana	SPWA-CC: Promoting of Appliance Energy Efficiency and Transformation of the Refrigerating Appliances Market in Ghana.	GEF-4	1.72
1532	World Bank	Philippines	Electric Cooperative System Loss Reduction Project	GEF-3	12.00
Renewable energy projects					
967	UNDP	Tunisia	Private Sector Led Development of On-Grid Wind Power in Tunisia	GEF-3	2.00
975	UNDP	Regional	Accelerating Renewable Energy Investments through CABEL in Central America	GEF-3	6.92
1894	World Bank	South Africa	Renewable Energy Market Transformation (REMT)	GEF-3	6.00
2499	UNDP	Guatemala	Productive Uses of Renewable Energy in Guatemala (PURE)	GEF-3	2.60
2531	World Bank	Macedonia	Sustainable Energy Program	GEF-3	5.50
2567	UNDP	Palau	Sustainable Economic Development through Renewable Energy Applications (SEDREA)	GEF-4	1.00
3959	UNIDO	Chad	SPWA-CC: Promoting Renewable Energy-Based Mini-Grids for Rural Electrification and Productive Uses	GEF-4	1.76
4005	UNIDO	Côte d'Ivoire	SPWA-CC: Promoting Renewable Energy-Based Grids in Rural Communities for Productive Uses	GEF-4	0.86
Sustainable transport projects					
3027	UNDP	Tajikistan	Support to Sustainable Transport Management in Dushanbe	GEF-4	0.97

GEF ID	Agency	Country	Project title	GEF period	GEF funding (mil. \$)
3759	UNDP	Serbia	Support to Sustainable Transportation System in the City of Belgrade	GEF-4	0.95
2609	World Bank	China	GEF-World Bank-China Urban Transport Partnership Program (CUTPP)	GEF-4	21.00
2767	World Bank	Regional	LAC Regional Sustainable Transport and Air Quality Project	GEF-3	2.90
4210	World Bank	Thailand	Sustainable Urban Transport in Chiang Mai	GEF-4	0.73
3027	UNDP	Tajikistan	Support to Sustainable Transport Management in Dushanbe	GEF-4	0.97

SOURCE: GEF PMIS.

Annex B: Individuals consulted

B.1 In-depth interviews

David Rodgers, GEF Secretariat
William Agyemang-Bonsu, UNFCCC Secretariat
Miguel Morales, Conservation International
Orissa Samaroo, Conservation International
Nomsa Zondi, Development Bank of South Africa
Ryan Alexander, European Bank for Reconstruction and Development
Napoleao Dequech Neto, Inter-American Development Bank
Annette Killmer, Inter-American Development Bank
Marcel Alers, UNDP
Geordie Colville, UNEP
Ruth Coutto, UNEP
Juergen Hierold, UNIDO
Pam Mikschofsky, UNIDO
Rana Ghoneim, UNIDO
Rana Singh, UNIDO
Laurent Granier, World Bank
Maria Cordeiro, World Bank
Gayatri Kanungo, World Bank
Shaanti Kapila, World Bank
Joonkyung Seong, World Bank
German Velasquez, Green Climate Fund Secretariat
Zhihong Zhang (CTF and SREP), CIF Secretariat
Ian Gray (FIP), CIF Secretariat

B.2 Stakeholders interviewed during fieldwork in Thailand

Sooksiri Chamsuk, Programme Officer, UNIDO

Jutamane Martchamadol, National Project Coordinator, UNIDO
Uma Wirutskulshai, National Project Coordinator, UNIDO
Jintipaporn Saiprom, Project Assistant, GEF, UNIDO
Stein R. Hansen, Regional Director and Representative, UNIDO
Sorat Phutthaphithak, Project Manager, Promoting Renewable Energy in Mae Hong Son Province, UNDP
Chanin Manopiniwes, Infrastructure Economist, World Bank
Rungnapar Pattanaviboo, Secretariat to the Operational Focal Point, Ministry of Natural Resources and Environment
Chatchai Kunlohit, Plan and Policy Analyst (Senior Professional Level), Policy and Strategy Coordination Office, Ministry of Energy
Pongpat Munkkunk, Director of Bureau of Energy Human Resources Development, Department of Alternative Energy Development and Efficiency, Ministry of Energy
Borwornpong Sunipasa, Plan and Policy Analyst
Thitapha Smitinont, Vice President, National Science and Technology Development Agency
Nattaka Singhavilai, Acting for Division Director, Industrial Technology Development Division; Innovation and Technology Assistance Program
Nantiya Viriyabanthorn, Deputy Division Director, Innovation and Technology Assistance Program
Songphon Munkongsujarit, Senior Consultant, Industrial Technology Development Division
Worawit Jirattiticharoean, Official, Department of Industry Promotion, Ministry of Industry

Warinthorn Songkasiri, Senior Researcher,
National Center for Genetic Engineering and
Biotechnology, Biotec (King Mongkut's Univer-
sity of Technology Thonburi)

Kuakoon Piyachomkwan, Principal Researcher,
National Center for Genetic Engineering and
Biotechnology

Trinnawat Suwanprik, Sanitary Researcher,
Chiang Mai Municipality

Siriluk Pantanan, Energy Technical Officer, Mae
Hong Son Provincial Energy Office

Sal Mulasastra, Executive Vice President, Facility
Management, CP Land

Chakraphant Piyaprucksapan, Assistant Vice
President, Facility Management, CP Land

Viwat lewsomjit, Property Management Depart-
ment Senior Manager, CP Land

Vinai Anusornthanawat, Technical Trainer/E&M
Consultant, CP Land

Kamol Tanpipat, Assistant Managing Director,
Bright Management Consulting Company Ltd

Grichawatch Techavanich, Assistant Project Man-
ager, Engineering Solutions Provider Co., Ltd.

Ekarin Erbim, Senior Project Engineer

B.3 Stakeholders interviewed during fieldwork in Morocco

Yasir Benabdallaoui, Program Advisor, UNDP

Amal Nadim, Program Analyst, Energy and Cli-
mate Change, UNDP

Roger Coma Cunill, Senior Energy Specialist,
World Bank

Rachid Firadi, GEF Operational Focal Point, Minis-
try of Energy, Mines, Water and Environment

M. Al Houari, Director of Energy Efficiency,
ADEREE

Ramdane Jamal, Director of Strategy, Planning
and Transport Coordination, Ministry of Equip-
ment, Transport and Logistics

Soraya Khalil, Chef de Division de l'Architecture et
de la Durabilité, Minister of National Planning,
Urban Planning, Housing and Urban Policy

M. Bardai, Director, Centre de Développement des
énergies renouvelables (Kder)

Annex C: Guidance-strategy mapping

This study conducted a full review of UNFCCC guidance issued to the GEF by the COP to assess the coherence of the GEF-6 Climate Change Mitigation Focal Area Strategy with that guidance. This assessment provides an update to the analysis of UNFCCC guidance provided in Technical Paper 2: Climate Change Mitigation (GEF IEO 2012a) prepared as part of the Evaluation of the GEF Focal Area Studies (GEF IEO 2013) in support of OPS5.¹

¹In keeping with the method of the previous analysis, only UNFCCC guidance that was issued before the GEF-6 programming directions went into effect on May 22, 2014 was included (i.e., guidance through COP-19 in November 2013). Guidance on GEF operational issues (e.g., project cycle, cofinancing, and resource allocation) as well as special GEF policies (e.g., gender and private sector engagement) are addressed through channels other than the focal area strategies and were therefore not included in the analysis.

The following mapping includes all topics of UNFCCC guidance that are related to focal area strategies; operational issues (e.g., project cycle, cofinancing, and resource allocation) and topics addressed by special GEF policies such as gender and private sector engagement are not included. For a full review and assessment of UNFCCC guidance issued to the GEF on climate change adaptation, see the 2016 LDCF and 2017 SCCF evaluations (GEF IEO 2016, 2018c).

UNFCCC COP guidance to the GEF	GEF-6 Programming Directions: CCM strategy
National communications and follow-up ④	
<ul style="list-style-type: none"> ▪ Request to continue providing information on activities relating to the preparation of national communications ▪ Request to continue providing information on approximate dates of completion and submission of national communications ▪ Request to continue to ensure that sufficient financial resources are provided to meet the agreed full costs of preparing national communications 	<ul style="list-style-type: none"> ▪ The CCM Focal Area Set-Aside will provide funding in the amount of \$130 million for meeting Convention obligations, including support to produce national communications
Education, training, and public awareness ②	
<ul style="list-style-type: none"> ▪ Request to provide financial resources to support the activities related to the implementation of Article 6 of the Convention ▪ Request to continue to provide financial resources to parties not included in Annex I, in particular African countries, least developed countries, and small island developing States to support the implementation of the work program 	<ul style="list-style-type: none"> ▪ The GEF-6 Strategy includes facilitating behavior change through education, awareness raising, and other practices to facilitate the uptake of mitigation options
Capacity development ①	
<ul style="list-style-type: none"> ▪ Request to continue to provide support for capacity-building activities in those countries with economies in transition that are currently receiving support 	<ul style="list-style-type: none"> ▪ Program 5 will support activities responsive to COP guidance on capacity building
Technology transfer and technology needs assessments ③	
<ul style="list-style-type: none"> ▪ Request to facilitate the funding for the implementation of technology needs assessment results ▪ Request to continue to provide financial support to other non-Annex I parties to conduct or update their technology needs assessments ▪ Request to support the implementation of country-driven projects identified in the technology needs assessments prepared by developing country parties 	<ul style="list-style-type: none"> ▪ Program Support for technology needs assessments is included in Objective 3, Program 5
Biennial update report ⑨	
<ul style="list-style-type: none"> ▪ Request to make available support to non-Annex I parties for preparing subsequent BURs; provide funds for technical support for the preparation of BURs ▪ Request to continue providing detailed, timely, and complete information on activities related to the preparation of BURs, as well as information on the funding available under its latest replenishment to non-Annex I parties for the preparation of BURs 	<ul style="list-style-type: none"> ▪ The CCM Focal Area Set-Aside will provide funding in the amount of \$130 million for meeting Convention obligations, including support to produce BURs

UNFCCC COP guidance to the GEF	GEF-6 Programming Directions: CCM strategy
Technology mechanism 6	
<ul style="list-style-type: none"> ▪ Request to support the operationalization and activities of the Climate Technology Center and Network (CTCN) without prejudging any selection of the host; provide financial and other support to the CTCN ▪ Request to further implement the element of the Poznan strategic program on support for climate technology centers and a climate technology network, which should be aligned with, and support, the operationalization and activities of the CTCN 	<ul style="list-style-type: none"> ▪ Support to the CTCN operationalization and activities is addressed under Objective 1 of the GEF-6 Climate Mitigation Strategy
Prototype of the registry 1	
<ul style="list-style-type: none"> ▪ Request to submit information on financial, technology, and capacity-building support available and/or provided for the preparation and/or implementation of nationally appropriate mitigation actions 	<ul style="list-style-type: none"> ▪ The GEF-6 Strategy supports nationally appropriate mitigation actions under Objectives 1 and 2
Nationally determined contributions 4	
<ul style="list-style-type: none"> ▪ Request to provide support for parties to initiate or intensify domestic preparations for their intended nationally determined contributions 	<ul style="list-style-type: none"> ▪ Program 5 will provide support to countries for domestic preparations for their intended nationally determined contributions
SIDS/LDCs 1	
<ul style="list-style-type: none"> ▪ Request to give due consideration to funding for SIDS and LDCs to enable them to address their urgent needs and to comply with their obligations under the convention 	<ul style="list-style-type: none"> ▪ The GEF-6 Strategy includes funding support for SIDS and LDCs
National portfolio formulation exercise 1	
<ul style="list-style-type: none"> ▪ Request to continue with its voluntary national portfolio formulation exercise, which has been proved to enhance coordination and coherence at the national level 	<ul style="list-style-type: none"> ▪ The national portfolio formulation exercise is included under the GEF Corporate Programs Strategy of the GEF-6 Programming Directions
Work program on results-based finance 3	
<ul style="list-style-type: none"> ▪ Request to channel results-based finance, taking into account different policy approaches, while working with a view to increasing the number of countries that are in a position to obtain and receive payments for results-based actions ▪ Request to apply the methodological guidance when providing results-based finance, to improve the effectiveness and coordination of results-based finance 	<ul style="list-style-type: none"> ▪ A performance-based mechanism is included under Program 2
Guidance issued after GEF-6 Strategy came into effect	
National communications and follow-up 6	
<ul style="list-style-type: none"> ▪ Request to continue providing detailed, accurate, timely and complete information on its activities relating to the preparation of national communications by non-Annex I parties ▪ Request to continue providing information on an approximate date of completion of the draft national communications and an approximate date of submission to the secretariat of the national communications 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect

UNFCCC COP guidance to the GEF	GEF-6 Programming Directions: CCM strategy
Education, training, and public awareness ②	
<ul style="list-style-type: none"> ▪ Request to report on the progress made in providing financial support and implementing activities to contribute to the implementation of the Doha work program 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Capacity development ⑤	
<ul style="list-style-type: none"> ▪ Request to make arrangements to support the establishment and operation of the Capacity-building Initiative for Transparency as a priority reporting-related need, including through voluntary contributions to support developing country parties in GEF-6 and future replenishment cycles, to complement existing support under the GEF ▪ Request to provide financial, technological, technical and capacity-building support to parties included in Annex I to the convention whose special circumstances are recognized by the COP in order to assist them in implementing their national strategies, actions and plans on climate change mitigation and adaptation, and developing their low-emissions development strategies or plans in accordance with Decision 1/CP.16 ▪ Request to integrate into work programs the lessons and outcomes of the Durban Forum ▪ Request to provide information to the secretariat for the capacity-building portal 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Technology transfer and technology needs assessments ①	
<ul style="list-style-type: none"> ▪ Request to provide financial support to parties not included in Annex I to the Convention that have not yet conducted their technology needs assessments under the Poznan strategic program so that they may do so, in accordance with Decision 11/CP.17, paragraph 2 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Biennial update report ⑤	
<ul style="list-style-type: none"> ▪ Request to continue providing detailed, accurate, timely and complete information on its activities relating to the preparation of BURs ▪ Request to continue to facilitate the preparation and submission of project proposals by non-Annex I parties for the preparation of their BURs 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Technology mechanism ④	
<ul style="list-style-type: none"> ▪ Request to provide more detailed information on its ongoing collaboration with the Climate Technology Center and Network in its future progress reports ▪ Request to continue to consult on and further elaborate on the linkages between the Technology Mechanism and the Financial Mechanism ▪ Request to consider and act upon the recommendations contained in the UNFCCC Subsidiary Body for Implementation report regarding the Poznan Strategic Programme on Technology Transfer 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect

UNFCCC COP guidance to the GEF	GEF-6 Programming Directions: CCM strategy
Nationally determined contributions ④	
<ul style="list-style-type: none"> ▪ Request to provide support for the preparation and communication of the intended nationally determined contributions of parties that may need such support ▪ Welcomed the approval of projects by the GEF to support 46 developing country parties in preparing their intended nationally determined contributions, and encouraged the GEF to continue such support ▪ Request to consider how to support developing country parties in formulating policies, strategies, programs, and projects to implement activities that advance priorities identified in their respective intended nationally determined contributions in a manner consistent with its operational policies and guidelines, starting in 2016 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Green Climate Fund ①	
<ul style="list-style-type: none"> ▪ Request to engage with the GCF and further articulate and build on the complementarity of policies and programs within the Financial Mechanism of the Convention 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Sustainable forest management ②	
<ul style="list-style-type: none"> ▪ Request to continue to provide finance to the activities referred to in Decision 1/CP.16, also taking into account Decision 9/CP.19, paragraph 8, and Decision 16/CP.21 ▪ Request to provide financial resources, including through the wide variety of sources referred to in Decision 2/CP.17, paragraph 65, for alternative policy approaches, such as joint mitigation and adaptation approaches for management of forests 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Paris Agreement ⑧	
<ul style="list-style-type: none"> ▪ Request to serve, along with other operating entities, as the financial mechanism of the agreement and support a range of new topics under the agreement ▪ Request to enhance the coordination and delivery of resources to support country-driven strategies through simplified and efficient application and approval procedures, and through continued readiness support to developing country parties, including the least developed countries and small island developing States, as appropriate 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Mitigation ambition ①	
<ul style="list-style-type: none"> ▪ Request to engage in the technical expert meetings and to inform participants of contributions to facilitating progress in the implementation of policies, practices, and actions identified during the technical examination process to enhance mitigation ambition 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect

UNFCCC COP guidance to the GEF	GEF-6 Programming Directions: CCM strategy
Fifth Review of the Financial Mechanism ②	
<ul style="list-style-type: none"> ▪ Request to address recommendations in future work, particularly with regard to the complementarity between the operating entities of the financial mechanism 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Gender mainstreaming ①	
<ul style="list-style-type: none"> ▪ Request to ensure that gender mainstreaming is implemented both within its portfolio and within its structure 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect
Nongrant instruments ①	
<ul style="list-style-type: none"> ▪ Welcomed the exploration of innovative nongrant instruments by the GEF, and encouraged the GEF to work with its Agencies, recipient countries and the private sector to submit proposals 	<ul style="list-style-type: none"> ▪ Guidance issued after GEF-6 Strategy came into effect

NOTE: Circled numbers are cumulative items of guidance issued from COP-18 through COP-19 (before GEF-6 strategy came into effect) and from COP-20 through COP-21 (after GEF-6 strategy came into effect).

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