



GREEN
CLIMATE
FUND

Independent
Evaluation
Unit



TRUSTED EVIDENCE.
INFORMED POLICIES.
HIGH IMPACT.

INDEPENDENT EVALUATION OF GREEN CLIMATE FUND'S ENERGY SECTOR PORTFOLIO AND APPROACH

Final report (*Volume I*)



GREEN CLIMATE FUND
INDEPENDENT EVALUATION UNIT

Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach

FINAL REPORT

02/2024

© 2024 Green Climate Fund Independent Evaluation Unit
175, Art center-daero
Yeonsu-gu, Incheon 22004
Republic of Korea
Tel. (+82) 032-458-6450
Email: ieu@gcfund.org
<https://ieu.greenclimate.fund>

All rights reserved.

First Edition

This evaluation is a product of the Independent Evaluation Unit at the Green Climate Fund (GCF/IEU). It is part of a larger IEU effort to provide open access to its research and work and to make a contribution to climate change discussions around the world.

While the IEU has undertaken every effort to ensure the data in this report is accurate, it is the reader's responsibility to determine if any and all information provided by the IEU is correct and verified. Neither the author(s) of this document nor anyone connected with the IEU or the GCF can be held responsible for how the information herein is used.

Rights and Permissions

The material in this work is copyrighted. Copying or transmitting portions all or part of this Report without permission may be a violation of applicable law. The IEU encourages dissemination of its work and will normally grant permission promptly.

The IEU reserves the right to edit text for brevity and clarity in subsequent reprints.

Citation

The citation details for this evaluation are as follows:

Independent Evaluation Unit (2024). *Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach*. Evaluation report No. 17 (February). Songdo, South Korea: Independent Evaluation Unit, Green Climate Fund.

Credits

Head of the GCF Independent Evaluation Unit: Andreas Reumann

Task managers: Daisuke Horikoshi, Principal Evaluation Officer; and Genta Konci, Evaluation Specialist; Independent Evaluation Unit

Editing: Beverley Mitchell

Layout and design: Giang Pham

Cover photo: © Daisuke Horikoshi, Rishabh Moudgill and Genta Konci; from 2023 country missions to Tonga, Zambia and Mongolia

A FREE PUBLICATION

Printed on eco-friendly paper

PREFACE

In the battle against climate change, getting interventions in the energy sector right could not be more crucial. Encompassing transportation, electricity and heat, buildings, manufacturing and construction, and more, this sector can account for over 75 per cent of greenhouse gas emissions worldwide. Global efforts to reduce emissions from the energy sector must be done in coordination with the growing demand for energy worldwide. As countries around the world continue to develop, and populations are lifted from poverty, energy demand grows. Yet millions of people around the world still do not have access to energy and cannot be left in the dark.

As the world's largest climate fund, mandated to support developing countries raise and realize climate ambitions towards low-emission, climate-resilient development pathways, the GCF can serve a key role. The Governing Instrument of the GCF highlights the urgent need for large-scale interventions within the energy sector that address not only greenhouse gas emissions but also increase the energy access of under-served people, create jobs and bolster economic growth. This recognition is now paired with concrete targets for the energy sector, as listed in the recently approved *Strategic Plan for the Green Climate Fund 2024–2027*.

The Independent Evaluation Unit was mandated with evaluating the GCF's energy sector, by assessing the relevance and effectiveness of the Fund's energy approach and portfolio performance through its first thematic evaluation. The evaluation found that the GCF approach to energy is country driven and that energy generation and access stands as the largest among all the Fund's results areas, with impact on both adaptation and mitigation efforts. There are promising signs of paradigm-shifting transformations towards low-carbon energy solutions such as advancements in energy access, set-up of institutional frameworks for energy generation, and solar energy market transformation. Encouraging outcomes were seen in innovative business models and initiatives designed to promote energy savings within the renewable energy sector.

Looking forward, the GCF should establish clear expectations for the energy sector's role and objectives; increase support for regulatory frameworks and institutional capacities in the energy sector; and develop a comprehensive approach to energy investment that considers demand-side measures such as energy efficiency, innovative energy technologies and new ways of extending its reach to vulnerable countries.

As the Fund enters a new strategic period, we hope this evaluation will assist the Board and the GCF in making choices that enable the achievement of the strategic plan and maximize the impact of its investment.

Andreas Reumann

Head of the Independent Evaluation Unit

Green Climate Fund

ACKNOWLEDGEMENTS

The Independent Evaluation of the Green Climate Fund’s Approach and Portfolio in the Energy Sector was completed through the combined efforts and contributions of many individuals from both within and outside the GCF. We would like to share our appreciation and special thanks to all interviewees and respondents who spent their valuable time and effort sharing their reflections and data with us, including members of the GCF Board, the GCF Secretariat, UNFCCC representatives, national designated authorities, government officials, representatives from civil society organizations and private sector organizations, and a variety of stakeholders from the GCF and within countries. Without them, the evaluation could not have been completed.

This evaluation was managed and completed by Ms. Genta Konci and Mr. Daisuke Horikoshi, with an evaluation team of Mr. Andreas Reumann, Mr. Susumu Yoshida, Mr. Rishabh Moudgill, Ms. Jennifer Pampolina, Ms. Laurene Torterat and Mr. Mutukwa Sikatala Ben Musole. We also thank Mr. Archi Rastogi for his support in the peer review process. The evaluation has been jointly written and is co-owned by a team of experts from Econoler: Ms. Amandine Gal, Ms. Stéphanie Nour, Mr. James Melanson, Ms. Gemma Pinol Puig, Mr. Laurent Kossivi, Ms. Laurence Martel, Ms. Lilit Gharayan, Mr. Krystian Feucht, Ms. Denista Ruseva and Mr. Ivan Gerginov.

We are thankful to Independent Evaluation Unit (IEU) roster editor Ms. Beverley Mitchell (who copyedited the evaluation report and case studies), formatting expert Ms. Giang Pham (who formatted the report), and team member Ms. Aidyn Kaiyrbekova (who provided editorial and formatting support). We also thank Ms. Viktoriya Khan, Mr. Seung-Moon Kang and Ms. Imee Necesito, who engaged in the data analysis and data quality assurance process for the evaluation.

We would also like to thank our external Advisory Group, Ms. Neha Sharma, Mr. Carlo Carugi and IEU colleagues for commenting on earlier versions of this report.

All responsibility, including for any errors, lies solely with the IEU, who carried out this assessment. Views expressed here are not a reflection of the official views of the GCF Board, nor of its members and the countries they represent.

LIST OF AUTHORS

The authors of the Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach are listed here in alphabetical order of their surnames:

FULL NAME	AFFILIATION
Amandine Gal	Econoler
Ivan Gerginov	Econoler
Daisuke Horikoshi	Independent Evaluation Unit, Green Climate Fund
Genta Konci	Independent Evaluation Unit, Green Climate Fund
James Melanson	Econoler
Rishabh Moudgill	Independent Evaluation Unit, Green Climate Fund
Stéphanie Nour	Econoler
Archi Rastogi	Independent Evaluation Unit, Green Climate Fund
Andreas Reumann	Independent Evaluation Unit, Green Climate Fund
Laurene Torterat	Independent Evaluation Unit, Green Climate Fund
Susumu Yoshida	Independent Evaluation Unit, Green Climate Fund

CONTENTS

PREFACE	III
ACKNOWLEDGEMENTS	IV
LIST OF AUTHORS	V
ABBREVIATIONS	XI
EXECUTIVE SUMMARY	XIII
MAIN REPORT	1
CHAPTER 1. INTRODUCTION	3
A. Background, purpose and scope of the evaluation.....	3
B. Methodology	3
C. Limitations and challenges.....	5
CHAPTER 2. BACKGROUND CONTEXT AND LESSONS	7
A. The global energy sector	7
1. Energy transition	7
2. Energy generation	8
3. Energy access.....	8
4. Energy transmission and distribution.....	9
5. Energy storage.....	9
6. New energy sources	10
7. Energy efficiency	10
8. Low emission transport.....	11
B. International climate finance landscape in the energy sector.....	11
1. Climate finance landscape by regions.....	13
2. Climate finance instruments.....	16

C.	The GCF’s approach to the energy sector.....	17
1.	GCF results areas	19
2.	GCF sectoral guides	20
D.	Project portfolio overview.....	21
E.	The private sector.....	26
 CHAPTER 3. RELEVANCE OF THE GCF APPROACH IN THE ENERGY SECTOR		 27
A.	Strategic guidance from the UNFCCC	28
B.	The GCF’s framework and strategies in the energy sector	29
C.	Country ownership.....	37
 CHAPTER 4. EFFECTIVENESS		 39
A.	Access to the GCF.....	41
B.	Private sector engagement.....	44
C.	Country engagement	46
D.	Enabling environment of the energy sector	48
1.	Co-benefits	51
2.	Gender and Indigenous Peoples	53
3.	GCF programming in energy subsectors.....	56
4.	Challenges in project implementation.....	60
 CHAPTER 5. EFFICIENCY.....		 63
A.	Programming modality.....	64
B.	Project origination and country programming	66
C.	Support modalities	68
D.	Cost-effectiveness of GCF energy sector projects.....	69
 CHAPTER 6. COMPLEMENTARITY AND COMPARATIVE ADVANTAGE OF THE GCF.....		 73

A.	Energy sector approach of multilateral climate funds.....	74
B.	Energy sector approach of MDBs	76
C.	Comparative advantage.....	80
1.	Size/scale of concessionality.....	80
2.	Different funding modalities	81
3.	Flexibility due to the absence of country or sector investment limits.....	82
4.	Regional coverage.....	82
5.	Country coverage	84
D.	Additionality	85
CHAPTER 7. PARADIGM SHIFT, RISK AND INNOVATION		89
A.	Potentials for paradigm shift.....	90
1.	Paradigm shift in energy efficiency investments	91
2.	Paradigm shift in energy access and power generation.....	91
B.	Risk and innovation.....	93
1.	Risk appetite.....	93
2.	Innovativeness of the projects.....	94
CHAPTER 8. MEASURING AND ACHIEVING RESULTS.....		99
A.	Monitoring and reporting	100
B.	Co-financing.....	103
CHAPTER 9. CONCLUSIONS AND RECOMMENDATIONS		107
A.	Conclusions.....	107
B.	Recommendations	113
ANNEX. LIST OF INTERVIEWEES		117
REFERENCES		127

TABLES

Table 2–1.	Energy sector approach in GCF strategic plans.....	18
Table 3–1.	Energy-related paradigm-shifting pathways in the 10 GCF sectoral guides	31
Table 4–1.	Current DAEs in the energy portfolio by GCF region	45
Table 4–2.	Core indicators for enabling environment, as defined by the IRMF Results Handbook, April 2022	49
Table 5–1.	GCF financing contribution cost-effectiveness, energy sector portfolio (USD/tCO ₂ e).....	70
Table 5–2.	Total financing (GCF + co-financing) contribution cost-effectiveness, energy sector portfolio (USD/tCO ₂ e).....	71
Table 6–1.	Comparison of the energy approaches of multilateral climate funds	75
Table 6–2.	Comparison of the energy approaches of the GCF and MDBs	78
Table 6–3.	Energy subsectors and greatest potential opportunities for the GCF	80
Table 6–4.	Total MDB adaptation and mitigation finance in the energy sector by region	83
Table 6–5.	Comparison of geographical distribution of investment in the energy sector between the GCF and MDBs.....	84
Table 6–6.	MDB climate finance for LDCs and SIDS.....	87
Table 8–1.	Co-financing ratio: based on the approved amount for GCF funding over the total approved, filtered by energy sector project, by region and by AE type.....	104

FIGURES

Figure 2–1.	Landscape of climate finance in 2021/2022.....	12
Figure 2–2.	Climate finance commitments, 2011–2022.....	13
Figure 2–3.	Climate finance in the energy sector landscape by region: comparison between MDBs (in 2022) and the GCF (overall).....	15
Figure 2–4.	Climate finance landscape by financial instruments: comparison between MDBs (in 2022) and the GCF (in 2023).....	17
Figure 2–5.	GCF energy portfolio investment by energy sector and subsector, in grant-equivalent terms.	22
Figure 2–6.	Evolution of the GCF investment, in grant-equivalent and in nominal terms.....	23
Figure 2–7.	Distribution of GCF investment in the energy sector by region.....	24
Figure 2–8.	Share of projects by division and sector*, in grant-equivalent terms.....	25
Figure 2–9.	GCF investment and GHG high-emitting countries 2015-2020.....	26
Figure 3–1.	Mitigation and adaptation over the GCF portfolio	36
Figure 3–2.	Evolution of the energy sector in the GCF themes.....	36
Figure 3–3.	Average iTAP and Secretariat ratings for country ownership criteria	37
Figure 4–1.	Count of entities implementing an energy project by AE type	42
Figure 4–2.	Distribution of energy projects by AE type (entire GCF portfolio)	43
Figure 4–3.	Distribution of GCF investments in the energy sector by AE type	44
Figure 4–4.	RPSP support on enabling environment for energy sector.....	50
Figure 4–5.	Share of projects contributing to co-benefits and type of co-benefits.....	52

Figure 4–6.	Project count and share of total number of GCF energy investments that especially target women	53
Figure 4–7.	Evolution of GCF energy generation investments: energy generation and access.....	57
Figure 4–8.	Evolution of GCF energy access investments	58
Figure 4–9.	Evolution of energy efficiency projects in the GCF (under results area “Building, cities, industries, and appliances”).....	60
Figure 5–1.	Time taken to progress energy and non-energy projects across the different project stages, in days (2015–2023) including SAP.....	65
Figure 5–2.	Cost-effectiveness for GCF energy projects by type	72
Figure 8–1.	Achievement status for the core indicators 1.1. and 3.1 for four projects.....	101
Figure 8–2.	Share of climate finance instruments, by debt distress level (2021)	105
Figure 8–3.	Evolution of energy project total investments, by financial instrument.....	106

BOXES

Box 6–1.	Improving clean energy access in SIDS	86
Box 8–1.	NDCs analysis	103

ABBREVIATIONS

ADB	Asian Development Bank
AE	Accredited entity
AFD	<i>Agence Française de Développement</i>
AfDB	African Development Bank
APR	Annual performance report
B.37	Thirty-seventh meeting of the Board
BESS	Battery energy storage system
C&I	Commercial and industrial
CDB	Caribbean Development Bank
CIF	Climate Investment Funds
CPI	Climate Policy Initiative
CTF	Clean Technology Fund
DAE	Direct access entity
DMA	Division of Mitigation and Adaptation
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EMDE	Emerging market and developing economies
ESCO	Energy services companies
ESS	Environmental and social safeguards
FAA	Funded activity agreement
FP	Funding proposal
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse gas
GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>
HLCCP	High-Level Commission on Carbon Prices
IAE	International accredited entity
IAT	Innovation and Additionality Tool
IBRD	International Bank for Reconstruction and Development
IDB	Inter-American Development Bank
IEA	International Energy Agency
IEU	Independent Evaluation Unit
IFC	International Finance Corporation

IPCC	Intergovernmental Panel on Climate Change
iPMS	Integrated Portfolio Management System
IRENA	International Renewable Energy Agency
IRM	Initial resource mobilization
IRMF	Integrate results management framework
iTAP	Independent Technical Advisory Panel
LAC	Latin America and the Caribbean
LDC	Least developed country
MDB	Multilateral development bank
MEPS	Minimum energy performance standards
MSME	Micro-, small- and medium-sized enterprise
MW(He)	Megawatt(-hour equivalent)
NDA	National designated authority
NDC	Nationally determined contribution
NZE	Net zero emissions
PAP	Proposal Approval Process
PEEB	Programme for Energy Efficiency in Buildings
PPF	Project Preparation Facility
PPG	Project Preparation Grant
PSAA	Project-specific accreditation approach
PSF	Private Sector Facility
PV	Photovoltaic
RFP	Request for proposals
RMF	Results management framework
RPSP	Readiness and Preparatory Support Programme
SAP	Simplified Approval Process
SCF	Strategic Climate Fund
SEF	Sustainable Energy Facility
SIDS	Small island developing States
SREP	Scaling up Renewable Energy Program
STAP	Scientific and Technical Advisory Panel
STAR	System for transparent allocation of resources
tCO₂e	Tons of CO ₂ equivalent
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

INTRODUCTION

This evaluation was approved by the Board of the Green Climate Fund (GCF) at its thirty-fourth meeting, through decision B.34/08, and as part of the Independent Evaluation Unit's (IEU) 2023 Workplan.

According to the Intergovernmental Panel on Climate Change (IPCC), renewable energy must supply 70 to 85 per cent of all electricity by 2050 for the world to meet the Paris Agreement's goals and keep global temperatures well below 2°C. The Governing Instrument of the GCF aims for the GCF to contribute to the achievement of the objectives of the United Nations Framework Convention on Climate Change (UNFCCC). As an operating entity of the Financial Mechanism of the UNFCCC, the GCF provides support for climate change mitigation and adaptation projects and programmes in developing countries, working to advance and promote a paradigm shift towards low-emission and climate-resilient development pathways in developing countries.

This evaluation assesses whether and the extent to which GCF approaches and investments in the energy sector are effective in contributing to the objectives of the UNFCCC and other global agendas. It examines the GCF's effectiveness and efficiency in reducing the effects of climate change, and promoting a paradigm shift towards low-emission and climate-resilient development pathways through its investments in the energy sector. It analyses the results achieved and paradigm shift emerging on the ground. It also considers the diverse context of the countries and the markets and explores how these differences have informed, enabled, or constrained their engagement with the GCF.

METHODOLOGY

The evaluation used mixed methods for data collection and analysis, as established in the approach paper (Independent Evaluation Unit, 2023b). The findings were based on an extensive document and literature review; semi-structured interviews with more than 200 stakeholders; six case studies and analysis; gender and Indigenous Peoples analysis; and benchmarking with comparator organizations and portfolio and data analysis, led by the IEU DataLab.

CONCLUSIONS

Relevance

Conclusion 1. As a key operating entity under the financial mechanism of the UNFCCC, the GCF has a prominent position in the climate finance landscape through its reach, size, partners, legitimacy and modalities. However, the GCF's goals and intended pathways in catalysing a paradigm shift in the global energy sector seem less clearly articulated. For instance, the portfolio lacks intentionality for achieving a global energy transition, and its passively articulated strategic positioning translates into limited alignment across frameworks and guidance for project development.

- The evaluation finds that the GCF programming and operations generally align with UNFCCC principles. The new *Strategic Plan for the Green Climate Fund 2024–2027* emphasizes the GCF's role in a just transition. However, the GCF has yet to take initial steps to integrate just transition principles into its energy sector approach.

- **The GCF has many comparative advantages as a fund dedicated to climate action.** These include the size of its interventions and its coverage, diversity of instruments, risk appetite and legitimacy as a United Nations fund. Although the GCF is primarily seen as a finance provider, its position and priorities in the energy sector are less visible to partners.
- **Consequently, the portfolio does not actively seek synergies beyond project-level impacts. Further, the GCF does not have a strategically integrated approach to energy investment between supply-side and demand-side measures or across energy subsectors at the portfolio level.** The Fund is in the process of contributing extensively and effectively to the deployment of renewable energy generation. However, it is underfinancing energy efficiency compared to its potential for greenhouse gas (GHG) abatement. Evidence also suggests that the GCF does not significantly prioritize energy storage, transmission and distribution at scale or emphasize new or “emerging” energy sources. For example, the GCF could consider coupling supply-side and demand-side approaches to increase energy reliability and reduce vulnerability to climate change. Coupling is especially important for energy access projects where the supply side is fully decarbonized but the demand side still uses inefficient equipment and appliances that hinder a complete transition. This balanced approach is not evident in GCF energy sector investments to date.
- **From an energy sector perspective, project development and applying frameworks and tools for project development are not standardized and mainstreamed.** The limited alignment between concept note development, investment decisions and results management creates challenges for country partners and implementing entities. Two important frameworks exemplify this dissonance: (i) the sectoral guidance that provides information on how targeted GCF investments aligned with country priorities could achieve optimal impact for identified sectors and subsectors, and (ii) the results areas defined by the integrated results management framework (IRMF) for results management of adaptation and mitigation projects/programmes.
- Sector-specific guidance is mainly contained in 10 sectoral guides provided by the GCF Secretariat. While these 10 guides may support project origination and development, the evaluation could not find evidence of their systematic use among stakeholders or that they resulted in high-quality and impactful funding proposals for the GCF Board’s consideration. The set of sector guides addresses several aspects of the energy sector but is not comprehensive enough to include newer subsectors, technologies or impact areas. Also, as they are not widely known within the GCF ecosystem and among energy sector stakeholders, their utility as reference documents is inconsistent. The sectoral guides’ limitations have led to energy-related GCF-funded activities being incorrectly classified and a lack of standardization and systematic cross-referencing in mapping GCF projects.
- **As per the guidance in the IRMF, GCF-funded projects in the energy sector are not always classified under climate change adaptation, presenting a missed opportunity to accurately manage or measure activity results.** The GCF does not comprehensively define the concept of adaptation in energy projects, as most frameworks and sector guidance fail to mention it. The only GCF-funded projects that clearly identify adaptation are those that include energy access. While energy efficiency and energy generation projects could provide solutions to climate change adaptation and resilience challenges in countries, they are not explicitly considered adaptation projects. This challenge particularly applies to the energy portfolio in vulnerable countries, such as small island developing States (SIDS), least developed countries and African States.

Energy sector programming

Conclusion 2. While the GCF's programming in the energy sector shows substantial volume, reach and use of a diverse set of financial instruments, the Fund has yet to identify and engage the right actors to support achieving strategic and coordinated programming at the country, regional and global levels. National designated authorities (NDAs) lack the necessary power to convene public and private entities in the energy sector, and the GCF has missed some opportunities to optimize dedicated support to countries. Co-benefits, in particular gender considerations, in the GCF-funded activities in the energy sector are insufficiently addressed for gender transformation and are limited to commentary on the process identified in gender action plans.

- **From the overall portfolio perspective, the GCF's use of diverse financial instruments is unmatched by other comparable agencies and funds.** The GCF portfolio includes large volumes of debt and reimbursable financing at highly concessional rates, which have helped with the financial flows in developing countries, strengthening financial systems and scaling green loans. To a limited extent, the Private Sector Facility (PSF) portfolio comprises a mix of financial instruments and grants, particularly equity and grants. Such an approach is often particularly useful for not yet commercially viable investments that focus on establishing markets, supporting ecosystems and identifying a specific development impact. So far, the GCF's PSF seems to limit such approaches to projects in the energy access subsector.
- **Country ownership has been found to be a key prerequisite for successful GCF programming, in particular in the energy sector.** Based on the engagement with country stakeholders, the evaluation identified three main drivers for country ownership: (i) leadership of the country in the strategic processes for identifying projects, aligned with national strategies across government ministries, (ii) institutional capacity to plan and manage climate activities and investments, and (iii) countries, entities and the GCF share a common vision about best practices in planning and delivering climate action. The GCF has developed an extensive regional and country coverage through its network of 54 accredited entities (AEs) and 148 NDAs working with GCF-funded projects with relevance to the energy sector. It can support energy sector projects in countries with less access to international climate finance, including in SIDS, where the small size of markets makes them unattractive for investors looking to deploy funding at scale.
- **While the GCF project origination for energy projects is country driven, GCF programming is hindered by the inefficiencies of the NDA-driven model related to coordinating, engaging and mobilizing energy sector stakeholders.** In most cases, NDAs and focal points work under the auspices of a government ministry, such as the Ministry of Finance or the Ministry of Environment. Such institutional arrangements often pose coordination challenges with the energy ministries. Common structural and institutional challenges include a lack of institutional authority, inadequate technical expertise, political affiliations and alignment between ministries regarding the planning processes in the energy sector. In practice, country ownership is operationalized via the NDA and/or focal point. The NDA or focal point's position has been identified as a key driver in ensuring alignment between GCF-funded projects/programmes and country energy transition strategies. The evaluation found broader alignment with the countries' nationally determined contributions and, where available, their national energy sector strategies and plans. In contrast, alignment with country priorities has been more challenging in multi-country projects at the regional and global levels.

- In the energy sector, the evaluation team found challenges with coherence and complementarity at the country level. Country partners, entities and the GCF often lack a common vision. In the GCF, country ownership is driven by the NDA and focal points. Consequently, the evaluation finds limitations in effectively engaging various stakeholders – particularly the private sector – in national, regional and global energy sectors. So far, most projects in the energy sector are implemented by international accredited entities (IAEs) or local financial institutions. NDAs find it challenging to meaningfully convene commercial-type private sector direct access entities (DAEs) and engage with prominent actors in the wider energy sector. The evaluation observed that although the GCF has potentially extensive regional and country coverage, the energy sector faces limitations in accessing finance due to the limited use of national and regional DAEs on the one hand and limited use of the Readiness and Preparatory Support Programme (RPSP) on the other. This is particularly important for vulnerable countries, such as SIDS, where IAEs looking for funding at scale may deem a small project proposal unattractive and unprofitable. The evaluation found that ensuring future project diversity and private sector involvement in the GCF's energy portfolio will become difficult if such a trend continues. Thus, the energy portfolio may not be able to contribute meaningfully to the institutional targets of the GCF.
- **GCF energy projects have paid increasing attention to mainstreaming gender and Indigenous Peoples since the GCF established the respective policies in 2019.** However, action plans for energy projects only partly address women's inclusion in the energy value chain. Gender action plans are not always scoped to or integrated with the main results frameworks of projects. They tend to focus on women's participation in project activities but not necessarily on their full potential role as stakeholders and entrepreneurs. Therefore, the portfolio is not yet gender transformative. It is estimated that 37 per cent of all GCF projects have a potential impact on Indigenous Peoples, and 50 per cent of energy projects target Indigenous Peoples. Few energy projects addressing Indigenous Peoples showed results at the community level, such as the participation of Indigenous Peoples in project implementation.

Enabling environment for the energy sector

Conclusion 3. An enabling environment is critical for the success of climate investments, projects/programmes and, ultimately, wider transformation in the energy sector. While GCF frameworks, policies and strategies have identified the importance of an enabling environment for programming, it remains underemphasized in the implementation of the GCF's readiness and preparatory support and GCF-funded projects and programmes.

- **Readiness and preparatory support grants can provide greater support for an enabling environment at the country and regional levels in the energy sector.** This support is, however, underutilized. Enabling environment principles include strong, transparent legal and regulatory frameworks, especially to align policy frameworks between the country, regional and subregional levels; strong regulatory institutions; creditworthy off-takers in the energy sector; cost-reflective retail tariff structures; technical and commercial efficiency in the local energy sector; procurement processes; and strategic and integrated energy sector planning. Readiness is not yet fully utilized to assist capacity-building for the energy sector; remedying this will help ensure more coherent and systematic institutional support at the country level.
- **Project appraisal processes do not strongly emphasize or reinforce project components related to the enabling environment within funding proposals.** The GCF does not have a systematic approach to promoting activities for creating enabling environments, which limits

the incentive to support projects focused on establishing an enabling environment for energy sector projects. This could constrain stakeholders' capacity to undertake sector reforms that would support a paradigm shift. Unlike the Global Environment Facility (GEF) and multilateral development banks (MDBs), the GCF considers that the following project activity types do not deliver additionality: “project activity enables resource mobilization”, “project activity enables regulatory change” and “project activity promotes adoption of higher environmental and social standards” (Green Climate Fund, 2022e). This limits the incentive to support projects that establish an enabling environment for energy sector projects. The GEF and MDBs place greater emphasis (both in financial volume and type of activities) than the GCF on supporting energy sector governance, which is critical for properly integrating new energy technologies or sources in a market.

Risk and innovation

Conclusion 4. Given the high potential and level of development in the global energy sector, an adequate approach to risk management by the Fund is key for GCF programming. Risk is, however, limited in the GCF energy portfolio. Limited operationalization of a risk framework and an observed mismatch between actual and stated risk appetite presents a challenge for GCF programming in the energy sector. Lack of clarity around concepts for innovation and paradigm shift hinders the effectiveness of GCF-funded activities.

- **The GCF's comparative advantage lies in programming at scale, leveraging broad partnerships and willingness to programme with a higher risk appetite, particularly for the advanced global energy market.** While the mandate provides for such programming, the GCF has yet to fully utilize its potential to support riskier energy sector projects. The *Initial Strategic Plan for the GCF* (2016) identified the need for the GCF to “build on its comparative advantages and operate in coherence with the existing climate finance institutions”. At that time, the GCF's competitive advantages included programming and financing at scale, including leveraging additional finance from innovative and alternative sources and partnerships with public and private actors at different levels. The advantages also included higher risk-appetite levels than other funds, a willingness to pilot and pursue technological innovation, and a broad range of financing instruments. These advantages continue to be of particular relevance to the global energy transition. With the paper *GCF: Catalysing finance for climate solutions* (Green Climate Fund, 2023b), the GCF also identifies four key systemic transitions for GCF support – low-carbon energy for all, climate-resilient infrastructure, sustainable and secure food systems, and protection of ecosystems and biodiversity – alongside the following transformative objectives: enabling environment, de-risking investment, accelerating innovation and aligning with sustainable development. The current GCF energy portfolio does not fully align with this position. Although the GCF does not have specific cost-effectiveness targets, the GCF energy sector portfolio shows comparable values to those achieved by MDBs and other climate funds. In some energy subsectors, the Fund has room to focus less on cost-effectiveness, allowing it to consider engaging in riskier energy projects.
- **To date, the GCF's energy sector portfolio demonstrates a limited risk appetite for more transformational and innovative energy technologies such as offshore wind, green hydrogen and energy storage. The dominance of senior loans as a financial instrument for energy sector programming attests to a more risk-averse positioning.** Although the GCF clearly identifies “testing and deploying innovative large-scale market-based financial instruments for breakthrough technology innovations” as an action in the pathway for a paradigm shift (Green Climate Fund, 2022c), most entity and country stakeholders perceive the

GCF as one of the climate funds with a limited risk appetite for more transformational technologies. Different divisions within the Fund demonstrate varying degrees of risk appetite. There is a discrepancy between the evident risk appetite and the stated risk appetite in the energy portfolio. The risk appetite for energy projects does not reflect the GCF's intentions in the energy sector.

- **GCF support for certain energy projects can potentially generate a paradigm shift in the energy sector. However, paradigm shift is poorly tracked in energy sector projects.** GCF projects show promising signs of market transformation for solar energy by creating enabling conditions for market-driven delivery at scale. Other projects include setting up institutional arrangements for renewable energy generation, transmission and distribution; scalability in green financing; and shifting to renewable energy at a large scale. However, paradigm-shift potential (stated in funding proposals) lacks the level of detail necessary for its assessment in annual performance reports (APRs), due to the lack of defined criteria/metrics for measuring paradigm shift in project proposals.
- **The GCF has not clearly defined its expectations for innovation in the energy sector, although it has the access modalities to support innovative approaches and business models. The GCF has been somewhat innovative in using the right financing instruments and delivery mechanisms, but results to date are limited.** The conceptual definition of innovation has been very loose and subjective across funded proposals and project implementation. Often, it is used as a catchphrase without supporting information. Although still not formally defined, innovation may include, among others, untested technology, a well-established technology that is new to a particular market, or financial products and business models integrated innovatively. The GCF has contributed to project de-risking by providing a blend of financing instruments well suited to project requirements. The simplified approval process has not been fully utilized, despite its potential to support innovation by piloting and demonstrating approaches developed in other markets and adapting them to different contexts. The Request for Proposals (RFP) modality to support climate technology incubators and accelerators has the potential to drive innovation by supporting collaborative research, development and demonstration in climate technology innovation systems in the energy sector, but the pilot RFP has not been launched yet.

Measuring and achieving results

Conclusion 5. Generally, the results management has been underdeveloped to serve the Fund's needs to identify and demonstrate results. The results management of the GCF's investment portfolio continues to face legacy challenges. These challenges include poor quality at entry, limited GCF project/programme progress reporting and conceptual gaps in measuring the effectiveness of investments at the portfolio and project levels. Tracking of the GCF's strategic targets is yet to be integrated.

- **Most GCF projects are still at an early stage of implementation. Consequently, climate impacts are modest across the entire energy portfolio, but there are early indications that results are forthcoming.** Assessment in this evaluation report is based mainly on annual reporting (in APRs) on the expected impacts of GCF-funded projects, based on the logframes of the individual funding proposal packages. The GCF still struggles with inconsistencies in aggregating outcomes and impacts across GCF-funded projects. Nevertheless, the set of reviewed interim evaluations revealed that impact potential was low and varied across projects. Most impact potentials were reported in different financing approaches, technology transfer,

low-carbon energy adoption, market transformation and improved energy access. The sample of five GCF-funded projects with completed interim evaluations did not reflect the overall trends in the global energy sector and the GCF energy portfolio. Thus, the sample is not fit to propose an early overall portfolio-level impact. Another recurring challenge was the incompleteness of the portfolio data. The data regarding impact and project indicators are not consistently reported. Only a few projects have the complete set of baseline data, targets and progress-to-date information reported promptly.

- **The limited alignment between the Investment Framework and the IRMF systematically limits assessment of the effectiveness, outcome and sustainability of the energy sector portfolio of the GCF. Inconsistency and a lack of unity of metrics and methodologies for measuring paradigm shift at the project level present an additional challenge for results management.** Projects reviewed by the evaluation team showed inconsistent metrics and methodologies for measuring the paradigm shift of energy projects. Data on impact and project-level indicators are incomplete and not credible due to known limitations of self-reported information. So far, the results management system does not aggregate or report results at the energy sector portfolio level. Data are only partially reported in APRs. Also, an IEU assessment of the evaluability of GCF-funded projects found gaps and limited quality at entry in Board-approved funding proposals. The assessment shows that the monitoring and evaluation preparation of GCF energy projects remains weak – for example, in causal pathways, measurement, data collection and implementation fidelity.
- **Co-benefits are systematically underemphasized. The definition of co-benefits is not sufficiently comprehensive, nor are the results attributed and disaggregated for different beneficiary groups. While some projects of the GCF energy portfolio identify a limited set of co-benefits and track their results, several relevant co-benefits for energy sector projects are neither identified nor tracked.** The co-benefits currently observed in the GCF's energy sector portfolio include water access and sanitation, infrastructure resilience, and crop and food security. However, typical and relevant social, economic and environmental co-benefits, such as green jobs/employment, improved health, livelihoods or education considerations, are not identified or tracked at the project and portfolio levels. This limited understanding and tracking of potential co-benefits presents a missed opportunity for measurement of impact as well as a challenge for adaptive management. First, the extent to which these co-benefits accrue to women, youth, Indigenous Peoples and other potentially vulnerable groups is not tracked or reported. This is a missed opportunity to observe the wider impacts of GCF-funded projects and the economic and social performance of the Fund. Secondly, observing co-benefits supports the Fund's efforts to create sustainable investments and actions in a particular context. Observing indicators that could help identify early unintended consequences of GCF-funded activities is crucial, as it provides an opportunity for adaptive management of GCF projects/programmes. Lastly, evidence on the integration of the principles of just transition is lacking. The operationalization and monitoring of just transition have yet to be defined.
- **The GCF lacks specific emissions reduction targets for the energy sector, which will hamper the ability to monitor impact in the future.** The *Strategic Plan for the Green Climate Fund 2024–2027* establishes specific targets for the number of countries to receive support within the energy sector. Yet, in the current IRMF, there are no concrete targets for monitoring emissions reductions by energy projects or plans to integrate these targets. Similarly, while there is a heightened focus in the strategic plan on assisting “hard-to-reach”

developing countries and addressing “hard-to-abate” sectors, the progress tracking towards these objectives remains uncertain. These shortcomings can limit the GCF’s ability to assess the impact and efficiency of its energy investments in mitigating climate change.

RECOMMENDATIONS

Recommendation 1. The evaluation recommends that the GCF clarify the pathways for a paradigm shift in the energy sector and its intended role. Providing such clarity would include (i) considering the increased complexity of climate projects, (ii) increasing emphasis on energy efficiency, (iii) linking demand and supply in energy generation, and (iv) considering new and innovative technologies and approaches for piloting and scaling projects.

1.1. As a key global actor and the major multilateral climate fund, the GCF should clarify its position and intention in the energy sector. It should describe its expected paradigm-shifting pathways for the energy sector more explicitly, setting out relative priorities for programming across subsectors and providing clearer guidance to stakeholders. The results framework should, in turn, lead to a more coherent approach to project classification. The GCF should consider identifying its intended role in the global energy market, based on which it could define intended portfolio results, which can inform the design of individual projects and readiness support.

1.2. This evaluation recommends that the GCF consider a paradigm shift in the energy sector through comprehensive approaches, ensuring that renewable energy generation projects are consistently complemented with grid integration and storage and that demand-side measures, including energy efficiency, receive increased investment. Renewable energy generation projects should be more consistently complemented with grid integration and storage. Renewable energy generation is generally intermittent (wind, solar PV, solar thermal, tidal, etc.). So, to ensure a 100 per cent renewable energy supply, large-scale storage systems, adapted and integrated transmission, and distribution networks using smart-grid technologies are required to match power generation and demand. Solar thermal should be promoted for low- to medium-temperature use as domestic hot water.

1.3. Demand-side measures should be more strongly supported by increasing the integration of energy efficiency activities in GCF energy projects. The GCF should clarify how the variety of energy considerations and energy subsectors could be reflected in the results areas of the IRMF. For instance, the GCF should consider establishing a results area on energy efficiency, whose benefits would include energy savings and GHG emissions reduction and improved indoor and outdoor air quality, water security, health and well-being, and poverty alleviation. This will also help the GCF balance its allocation between adaptation and mitigation, as energy efficiency projects and programmes in buildings and cities can have a high resilience impact for communities.

1.4. The GCF should consider new technologies in offshore wind, green hydrogen, energy storage and new approaches in the energy market, particularly those for energy efficiency, by using more of its piloting tools.

Recommendation 2. The GCF should cultivate an energy portfolio that has a clear internal logic guided by the GCF’s intended role to promote an energy (system) transition. The available tools for programming should be optimized accordingly, including (i) an explicit approach to a paradigm shift, (ii) clarifying the intended use of sectoral guidance, (iii) clarifying and developing guidelines for classifying energy projects, and (iv) fully operationalizing just transition principles in energy sector programming.

2.1. Guidance from the Strategic Plan for the 2024–2027 period should be clearly interpreted in the energy sector strategic approach, including “hardest to reach” countries and “hard to abate” sectors (usually heavy industry and heavy-duty transport). The evaluation team recommends that the “hardest to reach” countries should be defined for application in the energy sector by taking into account (i) GHG emissions per inhabitant, (ii) perceived risk for private financing, and (iii) level of support from other financing institutions.

2.2. Operationally, this can be achieved by clarifying the purpose and intended use of GCF sectoral guides. The intended purpose of the guides needs to be further clarified by specifying the target audience and the scope of projects’ compliance with the guides. The guides should be standardized to facilitate users’ understanding and navigation. They should serve as guidance on potential project content only, without overlapping with other appraisal guidance documents and tools such as the Investment Criteria Scorecard. There should be separate guidance for energy access and power generation (as their purpose, scope and key performance indicators differ). Sectoral guides should be updated so cross-referencing is complete and coherent. All guides should have the same structure and clear cross-referencing. Finally, all sectors and subsectors should be covered, with the addition of some not sufficiently addressed areas, including solar water pumping, energy efficiency in public lighting and water/wastewater treatment, and regulatory support to the phase out of coal, oil and gas.

2.3. The GCF should clarify and develop guidelines within the sectoral guides for categorizing energy projects as adaptation or mitigation. This could be based on their expected impacts, leading to a better balance between mitigation and adaptation. For example, energy access projects produce adaptation results, which should be adequately reflected.

2.4. The GCF should clarify how it wishes to operationalize and mainstream the notion of just transition through the lens of energy transition. Clarity on just transition needs to be included in guidance and tools and assessed in projects at the proposal and monitoring stages to provide evidence on compliance of the GCF with just transition principles for the energy sector. If the GCF is willing to integrate just transition principles fully into its operation, as stated in the *Strategic Plan for the Green Climate Fund 2024–2027*, then the GCF should consider setting standards, building capacities and supporting the operationalization of just transition principles in energy sector investments, based on UNFCCC guidance.

Recommendation 3. The GCF should take an active approach to supporting enabling environments and institutional capacities opportunistically, using the RPSP and funding proposals in the energy sector. The GCF should consider reviewing its in-country institutional set-up and engagement to increase its effectiveness.

3.1. Where the opportunity arises, RPSP grants could be more widely deployed in the energy sector to prepare institutions and enabling environments for sustainable project investments. Part of this could be to support the NDAs in engaging with key public energy sector stakeholders to better assess needs, identify institutional capacity constraints and regulatory barriers and facilitate project origination. The GCF could rely even more on the ongoing support of AEs, since they are already well acquainted with energy sector stakeholders through their ongoing development of energy projects.

3.2. The Secretariat should review the country engagement model, which shows limitations regarding stakeholders’ engagement, and explore new ways for NDAs to engage more effectively with the line ministries and public institutions involved in the energy sector.

3.3. The GCF should strengthen its focus on the enabling environment, including strengthening institutional and regulatory frameworks; technology deployment; transfer and innovation; market development and transformation at the sectoral, local and national levels; and effective knowledge

generation and learning, as set out in the IRMF. Particularly in public sector energy funding proposals, funds should be systematically dedicated to strengthening institutional capacities and enabling environments to mitigate potential barriers to successful implementation. For example, the GCF should consider project activity that enables regulatory change as being additional. This would allow it to support the strengthening of enabling environments and institutional capacities more effectively while complying with its additionality criteria.

Recommendation 4. The GCF should match its actual and stated risk appetites and take the risks required to optimize its role in the sector. The GCF should learn from and reinforce successful operations, such as de-risking projects with blended finance. The GCF should clarify and promote its expectations for innovation in the energy portfolio. This may require revisiting the approach to, assessment of and tolerance for risk in projects, programmes and modalities that emphasize innovation.

The GCF should develop clear guidelines on innovation in the energy sector and correlate them to the level of development of the target countries/markets, because what is considered an innovative investment in one country may be regarded as mainstream in another. There is typically a high correlation between innovation and project risk. If the GCF wants to finance more innovative projects, it must take on more risks. To achieve this, the GCF can take the following actions:

- 4.1.** Adapt its risk appraisal methodologies for public and private sector initiatives to reflect (i) the level of innovation of the project, including a matching tiered risk tolerance, and (ii) the level of experience of the AE, with AEs complying with higher risk categories benefiting from greater risk tolerance from the GCF.
- 4.2.** Consider increasing its appetite for credit risk in projects where the implementation risk is low and the expectation of achieving expected outcomes and a related paradigm shift is high, while continuing to de-risk projects using blended finance. The GCF can support riskier and less cost-effective energy sector projects.
- 4.3.** Develop consistent guidelines to define and rank innovative projects for innovation in (i) technology development and deployment, (ii) business models, (iii) structuring of financial instruments, and (iv) changing market behaviour and catalysing systemic market development changes. These criteria must be adjusted for the specific market where the project is implemented.
- 4.4.** Consider using RFPs to foster innovation and reactivating the discussion about the planned pilot programme to support climate technology incubators and accelerators.

Recommendation 5. The Secretariat should consider revisiting results management. The GCF could pursue a differentiated approach for results reporting based on the initial results management framework (RMF) and the IRMF. The GCF should place more emphasis on improving quality at entry and preparation for monitoring and evaluation. To improve the aggregability and reporting of results in the energy sector, the GCF could clarify and, where possible, harmonize measurement methodologies. Within energy projects, the Secretariat might consider requesting data on just transition principles, innovation and co-benefits to align the reporting with the future stated strategic view on the GCF's approach to the energy sector.

5.1. The GCF should especially improve the monitoring and results management of paradigm shift and innovation components, for the Fund. Expected results regarding innovation should be clearly stated at the funding proposal stage and uploaded to the project database of the GCF.

5.2. Given that a full alignment between the indicators of the RMF and IRMF has not been possible for the GCF energy project portfolio, the GCF should consider differentiated reporting on results.

Such differentiated reporting is particularly important for the following energy subsectors: “Energy generation and access”, “Energy efficiency” and “Transport”.

- 5.3.** Evaluability and quality at entry of funding proposals should be improved by strengthening the monitoring and evaluation frameworks in project proposals. High-quality monitoring tools and approaches can help attribute causal changes to GCF investments in a credible manner, and ultimately improve reporting of results.
- 5.4.** The GCF should explore ways and make efforts to ultimately direct a portfolio that is gender transformative, rather than only gender sensitive or gender neutral. As a first step, the GCF should improve the tracking of the results of the gender action plans and outcomes for Indigenous Peoples at the country and sector levels.
- 5.5.** Energy savings, the principal direct result of energy efficiency projects, can be evaluated in multiple ways. The GCF does not set a specific methodology for determining energy savings, which is adapted to the context. Reviewing these methodologies could be part of an assessment for a sample of GCF-funded energy projects and pipeline energy projects. These methodologies should be further harmonized between AEs, where possible.
- 5.6.** The GCF should revisit and further define types of co-benefits in GCF frameworks and policies. Revised co-benefits should relate to socioeconomic outcomes such as creating green jobs and improving health and education, observed in the global principles of just transition in the global energy sector. These considerations are important decision-making factors for national and development funding institutions and are key elements contributing to just energy transition. To the extent feasible, co-benefits should be reported according to beneficiary group socioeconomic status, including by gender and for Indigenous Peoples.
- 5.7.** The GCF should consider further operationalizing the GCF’s knowledge management function throughout the entire project and programme cycle, to support learning at the institutional level to inform project origination, country programming and future reviews of sectoral guidance.

MAIN REPORT

Chapter 1. INTRODUCTION

A. BACKGROUND, PURPOSE AND SCOPE OF THE EVALUATION

1. The Governing Instrument of the Green Climate Fund (GCF) aims for the GCF to contribute to the achievement of the objectives of the United Nations Framework Convention on Climate Change (UNFCCC). As an operating entity of the Financial Mechanism of the UNFCCC, the GCF provides support for climate change mitigation and adaptation projects and programmes in developing countries, working to advance and promote a paradigm shift towards low-emission and climate-resilient development pathways in developing countries.
2. According to the Intergovernmental Panel on Climate Change (IPCC), renewable energy must supply 70 to 85 per cent of all electricity by 2050 for the world to meet the goals of the Paris Agreement and to keep global temperatures well below 2°C. “Energy generation and access” is one of the eight main results areas of the GCF and is categorized under the Fund’s overall theme of mitigation.
3. The independent evaluations of the GCF’s Independent Evaluation Unit (IEU) support and inform the decision-making of the Board. As per the evaluation policy of the GCF, this independent evaluation serves the three functions of evaluations: accountability, learning and dialogue. The evaluation focuses on the GCF’s approach to the energy sector and was approved by the GCF Board in decision B.34/06.
4. The objectives of the evaluation include (i) evaluating the relevance and effectiveness of the GCF’s approach to the energy sector; (ii) assessing the results achieved as well as scenarios for future strategies of the GCF; and (iii) informing future strategy, policy or energy sector guidance in the GCF. The approach paper for this evaluation (Independent Evaluation Unit, 2023b) further clarified key areas, including comparative advantage, relevance, effectiveness, efficiency and results.

B. METHODOLOGY

5. The evaluation used mixed methods for data collection and analysis, as established in the approach paper (Independent Evaluation Unit, 2023b). These methods are outlined below.

Document and literature review

6. The evaluation team conducted an extensive document review of the GCF in general and key energy sector issues in particular. Key documents included GCF policies, strategic plans, operations manuals and sectoral guides, as well as Board decisions, meeting reports and discussions. In addition, relevant audits and evaluations, samples of concept notes and funding proposals (FPs), readiness proposals, Project Preparation Facility documents, country programmes and nationally determined contributions (NDCs) were included.
7. The review was extended to academic and non-academic papers that showcase challenges, solutions and innovations in the energy sector. Finally, the evaluation team also conducted a review of the relevant peer-reviewed and grey literature on the energy sector and climate change.
8. The team reviewed and synthesized 28 interim independent evaluations of energy projects, 26 energy annual performance reports (APRs), as well as past IEU evaluations (see Volume II). Other

analysis work included sampling and analysis of APRs, Readiness and Preparatory Support Programme (RPSP) proposals and completion reports, to synthesize key features and patterns and to generate additional evidence to strengthen triangulation.

Data analysis

9. The IEU DataLab led a systematic portfolio and document analysis, developing a typology of energy projects that was used for both qualitative and quantitative analyses. This typology recognized the diversity of energy projects in terms of their physical, institutional, financial and economic characteristics. DataLab determined the share of investment in GCF energy projects by re-classifying projects using the energy-related sectoral guides and results areas. The assessment included a review of the budget information within each FP and funded activity agreement (FAA) in order to determine the amount of investment dedicated to energy-related activities in the project.
10. The expected impact linked to energy-related activities in the energy portfolio was determined using information included in the FPs, APRs and other GCF documents. This analysis was done for each GCF approved project. Further analysis included the cost-effectiveness of GCF energy sector projects. The percentage of financial contributions to the energy sector by projects was used to better capture energy investment distribution. The evaluation team also utilized the GCF taxonomy¹ to identify and tag activities contributing to the energy sector (see Volume II for details).
11. The main data sets utilized were the grant-management software Fluxx, approved FPs, the integrated Portfolio Management System (iPMS), APRs, interim evaluations, the country and entity portal, financial records, and information from different divisions of the GCF.
12. The analysis was based on the data as of 23 October 2023 and includes funded projects approved through to the thirty-seventh meeting of the GCF Board (B.37). The evaluation considered all available APRs, completion reports and interim evaluations of energy projects.

Benchmarking

13. For benchmarking purposes, relevant agencies were identified, including (i) global climate finance organizations and funds; (ii) multilateral, bilateral and regional development banks; and (iii) agencies that have a strong focus on the energy sector in developing countries and least developed countries (LDCs). The team reviewed annual reports, energy approaches, programmes, strategies, policies and evaluations, and conducted key informant interviews to compare practices and glean lessons learned.
14. Sources of information included documentation review as described in paragraph 6 above; semi-structured interviews with energy sector staff of other agencies as well as GCF focal points; and some interviews from the case studies.

Semi-structured interviews

15. The evaluation conducted key informant interviews with a wide range of over 200 stakeholders from national designated authorities (NDAs), the GCF Secretariat, the independent Technical Advisory Panel (iTAP), the GCF Board (developed and developing countries), international, national and regional accredited entities (AEs), civil society and the private sector, as well as actors from government ministries, key government officials, and beneficiaries. Semi-structured interview

¹ An introduction to the Green Climate Fund taxonomy has been endorsed by the GCF Secretariat Senior Management Team. It is an internal working document and not mandatory in nature. Its utilization and uptake have been slow and inconsistent, with variations between departments. While recognizing the limitations of the taxonomy, the evaluation team employed it as the guiding framework for classifying energy projects. It was chosen because it is the sole available resource that offers a comprehensive set of definitions and their interrelationships for the energy sector.

protocols were developed and tailored for each stakeholder type and iteratively tested and improved. Key informant interviews were mostly held online, with a few held in person when feasible. Detailed and typed interview notes preserving confidentiality were coded in a user-friendly software platform, which facilitated qualitative analysis. See 0 for a full list of interviewees.

Country case studies

16. Six countries were identified for case studies: Chile, Indonesia, Mongolia, North Macedonia, Tonga and Zambia. Factors taken into consideration in selecting case study countries included geographical coverage and GCF priority areas; diversity of the energy subsector (energy access and generation, effectiveness, low-emission transport); approved readiness grants; project focus (mitigation, adaptation and cross-cutting); diversity of multi-country and single-country projects; financial instruments used; public and private sector projects; and diversity of AEs.

Gender and Indigenous Peoples analysis

17. The GCF's updated gender and Indigenous Peoples policies of 2019 call for an institution-wide commitment to promoting gender equality and social inclusion, including of minority groups, across its investment criteria and as "an integrated measure of the social dividends of the overall portfolio" (Green Climate Fund, 2019). Using these policies as a framework, the present evaluation assessed the extent to which gender and Indigenous Peoples are considered in the energy projects and how investments are contributing to lessen the gender gap and vulnerabilities of Indigenous Peoples populations. The evaluation also considered the extent to which the GCF commitment to gender equality and social inclusion is appropriately resourced and monitored.
18. A total of 11 projects were subjected to more in-depth assessment. These were selected based on (i) geographic coverage, territorial and socioeconomic characteristics, (ii) stage of implementation, and (iii) thematic coverage. A synthesis of the gender and Indigenous Peoples related findings from the six country case study reports and the 28 interim evaluations fed into the analysis. A literature review of lessons learned by other development partners in mainstreaming gender into the energy sector complemented the analysis of the GCF's own experience. Interviews with GCF Secretariat staff members responsible for reviewing project gender and Indigenous Peoples action plans were used to cross-check impressions, validate assumptions and triangulate the data.

C. LIMITATIONS AND CHALLENGES

19. The primary limitation of this evaluation was the difficulty in identifying and classifying energy projects within the GCF portfolio. The GCF had recategorized energy projects – initially categorized under the results area of "Energy generation and access" – using a sectoral guide approach that classified energy projects under energy efficiency, energy generation and access, and low-emission transport sectors, for better capturing the scope and impact of GCF investment in the energy sector. This new classification system encountered limitations in its applicability to certain energy projects, particularly those that span multiple sectors or early FPs. Additionally, the manual nature of the classification process made it more prone to errors and inaccuracies. To address this, the evaluation team cross-checked projects' classification based on their FPs and available data sets. Additionally, the classification of several projects, based on the GCF taxonomy, was compared and cross-checked against the classification based on results areas, to enhance the quality and accuracy of projects' classification. It is important to note that, for this evaluation, the GCF energy projects identified are based on the evaluation team's classification system. The evaluation team defined GCF energy

projects as those projects with inputs, activities, outputs and outcomes that have made a contribution to the energy sector.

20. Another challenge we encountered was the availability of data categorized by results areas and sectoral guides. Financial data related to results areas were accessible, but other data were organized according to the sectoral guides classification. The evaluation had to make opportunistic choices in order to effectively utilize the available data.
21. Another challenge revolved around weak, outdated and incomplete monitoring and evaluation data, particularly for APRs, RPSP completion reports, and interim evaluations. To mitigate these limitations, new data sets were developed to supplement the existing information. As well, the evaluation increased the focus on the country case study assessments.
22. An assessment conducted at the outset of the evaluation revealed the majority of projects and activities were still at early stages of implementation. This made it difficult to assess final results, impact and the potential for paradigm shift. The case studies and available energy project APRs were used to uncover factors that could influence results, outcomes and impact and to identify signals of a paradigm shift within the energy portfolio.
23. An additional challenge was the high turnover of GCF energy staff working on identified energy projects, which the evaluation team addressed by seeking out former energy staff and conducting extensive interviews with a large number of Secretariat members at both the managerial and technical levels.
24. An online survey did not yield a high response rate, despite the efforts of the team and the strategies deployed. Survey fatigue was a likely factor. Alternatively, the evaluation team reviewed previous surveys conducted by the IEU to calibrate current findings with stakeholders' perspectives.
25. One of the challenges of benchmarking was comparing the energy approaches (including policies and strategies) of different agencies that were enacted at different times over the last five years while the energy sector's needs and technologies have been constantly evolving, with climate change mitigation becoming a higher priority for governments globally. In some cases, the energy approach is embedded in climate change mitigation strategies and not clearly defined. The GCF energy approach is dispersed in various documents, as explained in Chapter 2.C below on the GCF's approach to the energy sector. Furthermore, cost-effectiveness calculations among the agencies selected for the benchmarking were not always available and fully comparable, as projects and methodologies varied, although the indicator of amount invested per avoided tons of CO₂ emissions was found to be the most commonly used indicator. It is important to recognize that cost-effectiveness, measured in terms of USD per tons of CO₂ equivalent (tCO₂e), can vary based on the type of project (e.g. energy access in remote areas) as opposed to large-scale renewable energy initiatives and changes in the costs of solar technologies over the past decade. Considering all these factors, the IEU calculated cost-effectiveness in average values. In this analysis, we have adopted the approach used by other organizations, basing our calculations on the funded amount and the expected reduction in tCO₂e. While this indicator provides a reference point for comparing the cost-effectiveness of our overall portfolio with those of similar organizations, it should not be used for simple comparisons, and these calculations are not intended to set any standards for the UNFCCC.

Chapter 2. BACKGROUND CONTEXT AND LESSONS

26. This chapter presents a synthesis of the current discussion regarding the energy sector, climate finance and the GCF. A synthesis of lessons learned from previous IEU evaluations is available in Volume II.

A. THE GLOBAL ENERGY SECTOR

27. Limiting global warming to 1.5°C will require a drastic improvement in current energy sector infrastructure. Large-scale interventions are especially important because fossil fuels account for around 90 per cent of global CO₂ emissions, resulting in a significant contribution to overall greenhouse gas (GHG) emissions (nearly 75 per cent) (Zhang, Guo and Taghizadeh-Hesary, 2023). The UNFCCC has identified the decarbonization of the energy sector as one of the thematic areas of their Climate Action Pathways (United Nations Framework Convention on Climate Change, n.d.). The thematic area focuses on four main decarbonization pathways to fully decarbonize the energy sector by 2050 – “aggressive efficiency measures, a mass expansion of renewables, electrification of end-use sectors and a shift from fossil to zero-emission liquid and gaseous fuels” (Global Climate Action and Marrakech Partnership, 2020) – and which are essential to the energy transition.

1. ENERGY TRANSITION

28. The term “energy transition” refers to the global energy sector’s shift from fossil-based systems of energy production and consumption to cleaner alternatives. The increasing penetration of renewable energy in the energy supply mix, the onset of electrification and the reduction of energy intensity are all key elements of the energy transition. The UNFCCC emphasizes the urgency of transitioning to clean energy sources, phasing out fossil fuels, and implementing various mitigation measures across sectors to achieve net zero emissions. These efforts are seen as opportunities for socioeconomic development and alignment with the Sustainable Development Goals (United Nations Framework Convention on Climate Change, 2023b). While providing substantial development prospects, the energy transition necessitates significant market transformations, especially in economies with growing energy needs and those depending on fossil fuels, many of which are developing nations.
29. A just energy transition takes account of the complex and differentiated socioeconomic realities of the populations impacted by the energy transition and rests on four core principles (Abrams and others, 2022):
- Distributive justice, according to which the fair share of costs and benefits from the energy transition is differentiated according to capacities
 - Procedural justice, referring to an equitable presence of stakeholders in the governance of the energy transition
 - Recognition, being the inclusion of all stakeholders and their stakes
 - Restorative justice, implying the reparation of harm done through power imbalance in history
30. Methodologically, just transition requires a bottom-up approach (Anantharajah and Setyowati, 2022; Cha, 2018); originating from the needs and perspectives of the most vulnerable and marginalized (Mejía-Montero, Alonso-Serna and Altamirano-Allende, 2020) across societies, communities and

individuals. In that sense, just transition requires shifting away from standard project assessment, implementation and evaluation approaches, which rarely fit with the resource limitations and the needs of the most vulnerable (Anantharajah and Setyowati, 2022; Mejía-Montero, Alonso-Serna and Altamirano-Allende, 2020; Sayegh, 2018). Making the energy transition just also implies accounting for the inequalities generated by past and current transition projects (Mejía-Montero, Alonso-Serna and Altamirano-Allende, 2020; Wang and Lo, 2021; Cha, 2018). In this context it is important not to overlook the added value of innovative approaches, such as Indigenous methodologies (Doyon, Boron and Williams, 2021; Mejía-Montero, Alonso-Serna and Altamirano-Allende, 2020).

31. Energy transition requires an appropriate policy framework to ensure it will be just and inclusive. It requires the development, deployment and integration of enabling policies, structural changes and an adapted holistic policies framework (International Renewable Energy Agency, 2023).
32. To move from the current “business as usual” energy scenario to the 1.5°C scenario, total energy investment from 2023 to 2050 would need to increase. It is expected that lower energy-efficient technology costs will draw investments in energy systems to USD 57 trillion between 2021 and 2030 (Araújo and others, 2024). Global investment for energy transition has been growing annually, but mostly in developed countries. For example, the Middle East and Africa accounted for only 2 per cent of the total investment in 2021 (International Renewable Energy Agency, 2022b).
33. The objectives for energy transition that were set by the IPCC in 2023, together with the International Energy Agency (IEA), include the following (Ribera and Birol, 2023):
 - Tripling global renewable energy generation capacity by 2030, with proper development of electricity grids
 - Doubling the rate of improvement in global energy intensity by 2030, mainly through energy efficiency and electrification policies
 - Scaling up investment in renewable energy and energy efficiency by mobilizing innovative financing mechanisms and reforming multilateral financing institutions
34. Diversification of energy generation infrastructure and demand-side management are required to increase energy security and reduce vulnerabilities to climate change. The conclusions of the IPCC and IEA are fully aligned with the position of the UNFCCC.
35. The various energy subsectors, presented below, will be part of the overall energy transition.

2. ENERGY GENERATION

36. The deployment of large-scale renewable energy plants will be needed to increase the share of renewable energy in the overall energy mix. By 2030, the share of renewable energy in generation would need to reach 68 per cent to achieve the scenario of limiting temperature rise to 1.5°C by 2050, with annual deployment of some 1,000 GW of new renewable power (International Renewable Energy Agency, 2023). In 2022, only about 300 GW was deployed, mainly in developed countries. The International Renewable Energy Agency (IRENA) recommends further effort in three areas to get back on track: (i) physical infrastructure, (ii) policy and regulatory enablers, and (iii) skills and capacities. Solar photovoltaics (PV) and wind (both onshore and offshore) would account for very significant shares of the deployment needed for the 1.5°C pathway.

3. ENERGY ACCESS

37. United Nations Sustainable Development Goal 7 aims to “ensure access to affordable, reliable, sustainable and modern energy for all”. Currently, there are more than 675 million people without

proper access to energy, around 80 per cent of them located in sub-Saharan Africa (United Nations, 2023). Clean energy access also includes access to clean cooking fuels and technologies, to which 2.4 billion people had no access in 2021. To reach the goal of universal access to modern energy,² the investment required per year is USD 25 billion.

38. Solar PV is the most common technology used for clean energy access. The IEA estimates that off-grid systems will be the low-cost solution for more than 70 per cent of rural people gaining electricity access over the coming decade (International Energy Agency, 2017). Unfortunately, the price of off-grid solutions, such as solar home systems, has risen since 2020 due to an increase in raw material prices and supply chain issues. Even people with access to modern energy are losing the ability to afford this access, mainly in sub-Saharan Africa and Asia.

4. ENERGY TRANSMISSION AND DISTRIBUTION

39. The World Economic Forum describes transmission and distribution of electricity as the clean energy transition's secret weapons (World Economic Forum, 2020). To integrate renewable energy generation in the electricity matrix of a country requires an increase in transmission and distribution networks. Inadequate networks lead to constant congestion and curtailment issues, which affect the economic viability of on-grid distributed renewable energy projects. In the past, electricity systems were designed based on centralized power plants. However, going forward, the transmission and distribution networks will need to evolve to allow for the incorporation of renewable energy generation plants, which are often located in remote areas and supplying variable electricity loads (International Energy Agency, 2021c).
40. Technical and non-technical losses on transmission and distribution networks are a key concern. Transmission and distribution losses of less than 7 per cent are considered acceptable and are typically within this range in developed countries. However, they are usually higher in developing countries. For example, in South Asia, transmission and distribution losses are greater than 15 per cent, and in the Middle East, North Africa and sub-Saharan Africa they are more than 10 per cent. In some countries the transmission and distribution losses can surpass 50 per cent.³ This is due to several decades of non-maintenance of the power grid, as well as poor financial and administrative management (Babayomi, Dahoro and Zhang, 2022).

5. ENERGY STORAGE

41. Energy storage facilitates reliable access to clean energy and has several purposes, including levelling imbalances of supply and demand, reducing the impact of energy costs and shaving peak demand (United Nations Economic Commission for Europe, 2023).
42. Utilities-scale and behind-the-metre batteries are enabling technologies in the landscape of the innovation options required to reach the reduction of fossil fuel in the energy sector, especially in the electricity production mix (International Renewable Energy Agency, 2022c). Although batteries represent a small part of the overall spectrum of energy storage options, they can offer an attractive way for intermittent solar PV and wind power generation to better match a power system's daily load curve. The surge in demand for lithium-ion batteries, coupled with ongoing supply chain disruptions, has resulted in long (over one year) delivery times and upward price volatility for

² "Modern energy access: Includes household access to a minimum level of electricity (initially equivalent to 250 kilowatt-hours (kWh) annual demand for a rural household and 500 kWh for an urban household)" (International Energy Agency, 2022).

³ For example, in Iraq.

lithium-ion batteries. Although energy storage has now been accommodated in the financial and technical structures of some power systems, this is not yet the case in the majority of countries.

6. NEW ENERGY SOURCES

43. Clean hydrogen⁴ is considered a key alternative for sectors that are otherwise difficult to decarbonize, such as heavy industry (steel, cement, petrochemicals, etc.), aviation and marine transport. However, the production of clean hydrogen will require large-scale investments and use of clean electricity.
44. Other emerging energy sources include bioenergy, geothermal energy and nuclear power in the form of small modular reactors. Although this reactor technology is advancing well, it will take some time before this becomes a mainstream option as it still needs to demonstrate commercial scale operating experience. Bioenergy⁵ should also play a key role in reaching the 1.5°C climate goal (International Renewable Energy Agency, 2022a). It is important given its potential to replace fossil fuel in all energy sectors, such as electricity production, end uses in industry, buildings and transport, and as a chemical feedstock.

7. ENERGY EFFICIENCY

45. According to the IEA, energy efficiency is the “first fuel of a sustainable global energy system”, given the mounting pressure to decarbonize and electrify in conjunction with emerging disruptions in clean technology supply chains and critical mineral supply risks (International Energy Agency, 2023b). Progress is being made mostly in developed countries. Among other things, it is important to promote energy-efficient appliances to meet increasing overall demand.
46. Energy efficiency policies are key to reaching the expected reduction in energy consumption. Mandatory minimum energy performance standards (MEPS) are now in place in over 100 countries. The GCF is supporting the development, deployment and enforcement of MEPS mainly through its Readiness programme in several countries. MEPS should be promoted in all key end uses – for example, space cooling and heating, refrigeration, lighting, wet appliances (e.g. washing machines), display technology (e.g. televisions), industrial motors and road transport. Unfortunately, in countries where no MEPS are in place, low-efficiency technologies are still dominating the market. Extending policies related to product energy efficiency has the potential to reduce annual global energy consumption by 9 per cent (International Energy Agency and others, 2023). Reductions in GHG emissions in agriculture, industry, transport, buildings, public services and urban areas can be achieved through a combination of energy efficiency and conservation and a transition to low-GHG technologies and energy carriers (Intergovernmental Panel on Climate Change, 2023).
47. It is encouraging to note that energy intensity (measured as MJ/USD) has generally improved in recent years, although Latin America and the Caribbean, Western Asia and Africa recorded the smallest average gains over the period 2010–2020 (1 per cent per year or less) (International Energy Agency and others, 2023, p. 4).

⁴ “Clean hydrogen refers to hydrogen produced through electrolysis powered from renewable sources (green hydrogen) and hydrogen produced from natural gas in conjunction with carbon capture and storage by steam methane reforming (blue hydrogen)” (World Economic Forum, 2023).

⁵ “Bioenergy is produced from organic material, known as biomass, which contains carbon absorbed by plants through photosynthesis. When this biomass is used to produce energy, the carbon is released during combustion and returns to the atmosphere” (International Energy Agency, 2023a).

8. LOW EMISSION TRANSPORT

48. Transport accounts for more than a third of CO₂ emissions from end-use sectors. Transport CO₂ emissions grew at an annual average rate of 1.7 per cent from 1990 to 2022, faster than any other sector, and emissions even rebounded in 2022 (post COVID) (International Energy Agency, 2023c). Ninety per cent of the transport sector still relies on fossil fuel, principally gasoline for cars, diesel for trucks, and jet fuel and kerosene for air transport. Some clean energy sources have been used for decades, such as ethanol and other biofuels, mixed with gasoline, to reduce emissions. An emerging clean energy source is green hydrogen, especially for heavy transportation. Although the importance of electrifying cars is widely recognized, focus should be also put on reducing emissions from road freight, shipping and aviation (International Energy Agency, 2023c).
49. According to the IEA, “to get on track with the Net Zero Emissions (NZE) by 2050 Scenario,⁶ CO₂ emissions from the transport sector must fall by more than 3 per cent per year to 2030” (International Energy Agency, 2023c). Besides the extensive work that will be needed on engineering design, manufacturing and supply chains, this will require a large effort on policies, logistics and working with municipalities and local transportation groups.

B. INTERNATIONAL CLIMATE FINANCE LANDSCAPE IN THE ENERGY SECTOR

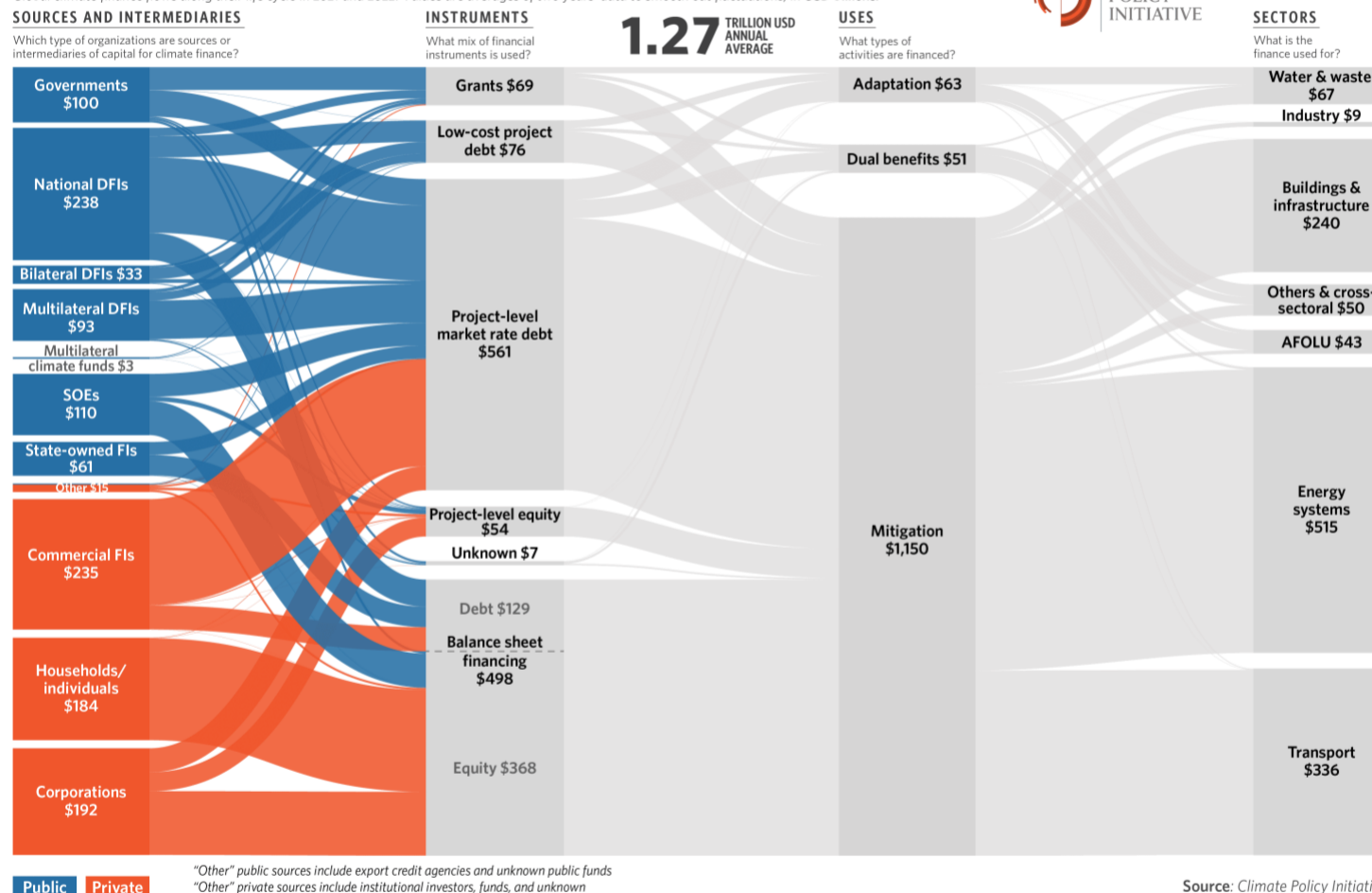
50. Climate finance refers to the financial resources that are mobilized to support climate change mitigation and adaptation actions, assisting in implementing the objectives of the UNFCCC.
51. According to the *Global Landscape of Climate Finance 2023* report by the Climate Policy Initiative, developed economies continue to mobilize the most climate finance, primarily from private sources (Buchner and others, 2023). East Asia and the Pacific, the United States and Canada, and Western Europe account for a combined 84 per cent of total climate finance. These regions also significantly outpace others in mobilizing domestic sources, which are critical to achieving scale. The report also states that average annual climate finance flows reached almost USD 1.3 trillion in 2021/2022, nearly double 2019/2020 levels. This increase was due to a significant acceleration in mitigation finance. According to the report, investments in low-carbon energy systems reached USD 510 billion in 2021/2022, of which USD 490 billion went to renewable energy generation.
52. As shown in Figure 2–1, climate finance is largely dominated by mitigation uses, mainly in the energy sector (renewable energy, power and heat transmission and distribution, and policy support and capacity-building), followed by the transport sector then building and infrastructure, which both include energy-related activities.

⁶ Further details on the Scenario are available at <https://www.iea.org/reports/global-energy-and-climate-model/net-zero-emissions-by-2050-scenario-nze>.

Figure 2–1. Landscape of climate finance in 2021/2022

LANDSCAPE OF CLIMATE FINANCE IN 2021/2022

Global climate finance flows along their life cycle in 2021 and 2022. Values are averages of two years' data to smooth out fluctuations, in USD billions.

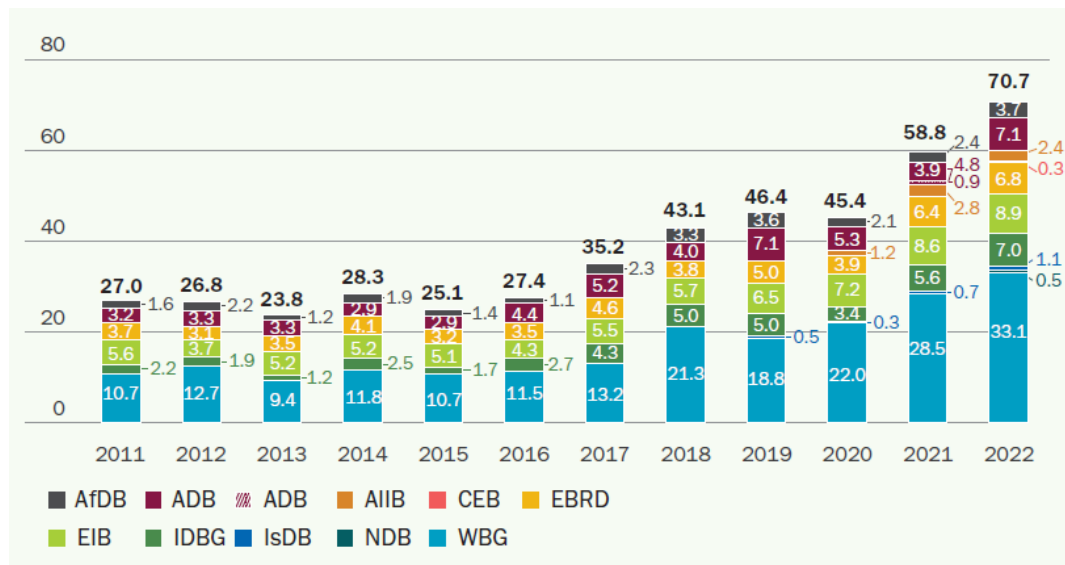


Source: Buchner and others (2023). Available at <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2023/>. Copyright © 2023 Climate Policy Initiative. All rights reserved, under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) Licence

53. The growth of the GCF's energy sector portfolio was in line with the overall growth of climate finance internationally. In 2020, the GCF disbursed USD 676 million in energy sector projects, and in 2021, it disbursed USD 1.31 billion. Although this may seem like a small contribution in comparison with global climate finance funding, the GCF targets developing countries, where climate finance is still scarce and numerous market barriers prevent private and public sector investors from engaging in climate investments at scale.
54. As shown in Figure 2–2, 10 multilateral development banks (MDBs) have increased their climate finance commitments for both mitigation and adaptation in the last 12 years. However, due to their focus on emerging market and developing economies (EMDEs), the growth of climate finance deployment did not follow the global climate finance trend – where commitments in 2021/2022 nearly doubled 2019/2020 levels, as noted above.

Figure 2–2. Climate finance commitments, 2011–2022

(USD billion)



Source: 2022 Joint Report on Multilateral Development Banks' Climate Finance. European Investment Bank (2023).

Note: AfDB = African Development Bank; ADB = Asian Development Bank; AIIB = Asian Infrastructure Investment Bank; CEB = Council of Europe Development Bank; EBRD = European Bank for Reconstruction and Development; EIB = European Investment Bank; IDBG = Inter-American Development Bank Group; IsDB = Islamic Development Bank; NDB = New Development Bank; WBG = World Bank Group.

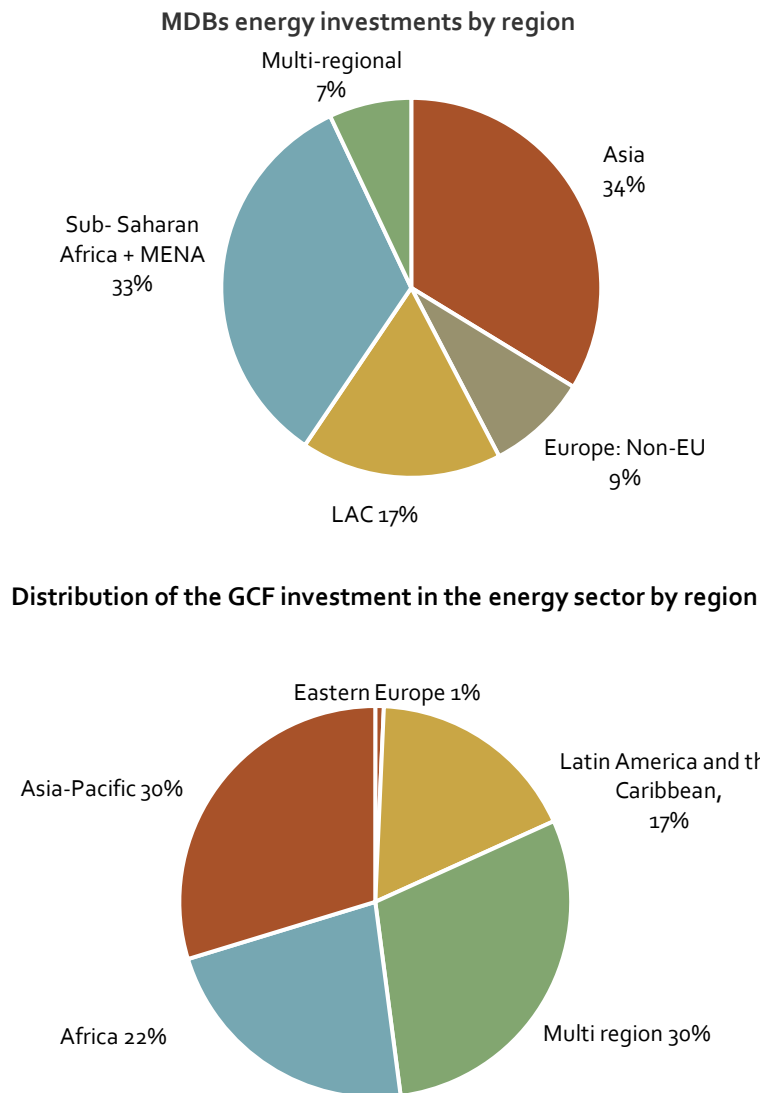
1. CLIMATE FINANCE LANDSCAPE BY REGIONS

55. Global climate finance remains significantly below target and concentrated in certain regions. In 2021, China, the United States, Europe, Brazil, Japan and India accounted for about 90 per cent of climate finance growth. In EMDEs, which will have the fastest growing energy demand in years to come (International Energy Agency, 2021a), there is competing demand for climate finance between mitigation, adaptation and energy access.
56. The energy sector stands out as an area experiencing the most substantial climate financing gaps in absolute terms, despite exhibiting a high level of compatibility with both development potential and GHG reduction potential.

57. EMDE countries, including small island developing States (SIDS), LDCs and those in sub-Saharan Africa, face specific challenges in energy climate finance. They are characterized by (i) high levels of national debt, making it more difficult (or outright impossible) to raise climate finance on international financial markets; (ii) regulatory frameworks that are non-conducive and limit the level of climate investments; (iii) underdeveloped local financial landscapes, which limit the ability of local financial institutions to serve as outreach channels to deploy climate finance; and (iv) perception of high risk from international investors (including climate investors).
58. These countries are in greater need of adaptation than of mitigation support. Unattractive for funding on commercial terms, they are largely dependent on support from MDBs and international financial institutions for energy climate finance. However, some market barriers (such as poor alignment of their local jurisdictions and financial ecosystems with international standards) impair these countries' ability to access MDB finance (including from the GCF).
59. Regional deployment of climate finance in the energy sector is difficult to reliably track because market players do not have uniform reporting standards. MDBs and international financial institutions use different taxonomies, sectoral breakdowns, and levels of detail of reported information, depending on their development objectives, targets and key performance indicators (KPIs). There is a certain degree of double counting of investments when blended financial instruments are being used, where several of the participating investors attribute the full project impact to their portion of the funding (each arguing that their participation was the critical component that made the project possible).
60. The *2022 Joint Report on Multilateral Development Banks' Climate Finance* provides data for 10 MDBs.⁷ For 2022, these MDBs deployed a total of USD 21.4 billion of climate finance, with a similar geographical prioritization to that of the GCF (i.e. focus on EMDEs, including sub-Saharan African countries and SIDS; a breakdown by region is presented in Figure 2–3) (European Investment Bank, 2023).

⁷ These being the African Development Bank, the Asian Development Bank, the Asian Infrastructure Investment Bank, the Council of Europe Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank Group, the Islamic Development Bank, the New Development Bank and the World Bank Group.

Figure 2–3. Climate finance in the energy sector landscape by region: comparison between MDBs (in 2022) and the GCF (overall)



Source: European Investment Bank (2023); and Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

Note: LAC = Latin America and the Caribbean; MENA = Middle East and North Africa.

61. The sectoral allocation of the climate investments made by MDBs in 2022 was as follows:
 - USD 6.8 billion targeted adaptation projects in energy, transport, and other built environment and infrastructure (this category likely includes a large portion of non–energy-related investments).
 - USD 11.7 billion targeted mitigation investments in energy.
 - USD 2.9 billion targeted mitigation investments in buildings, public installations and end-use energy efficiency (this category likely includes some non-energy-related infrastructure investments).
62. The European Investment Bank (EIB) observes that about 95 per cent of the reported investments were financed with funds leveraged by the MDBs (from their shareholders or from the financial

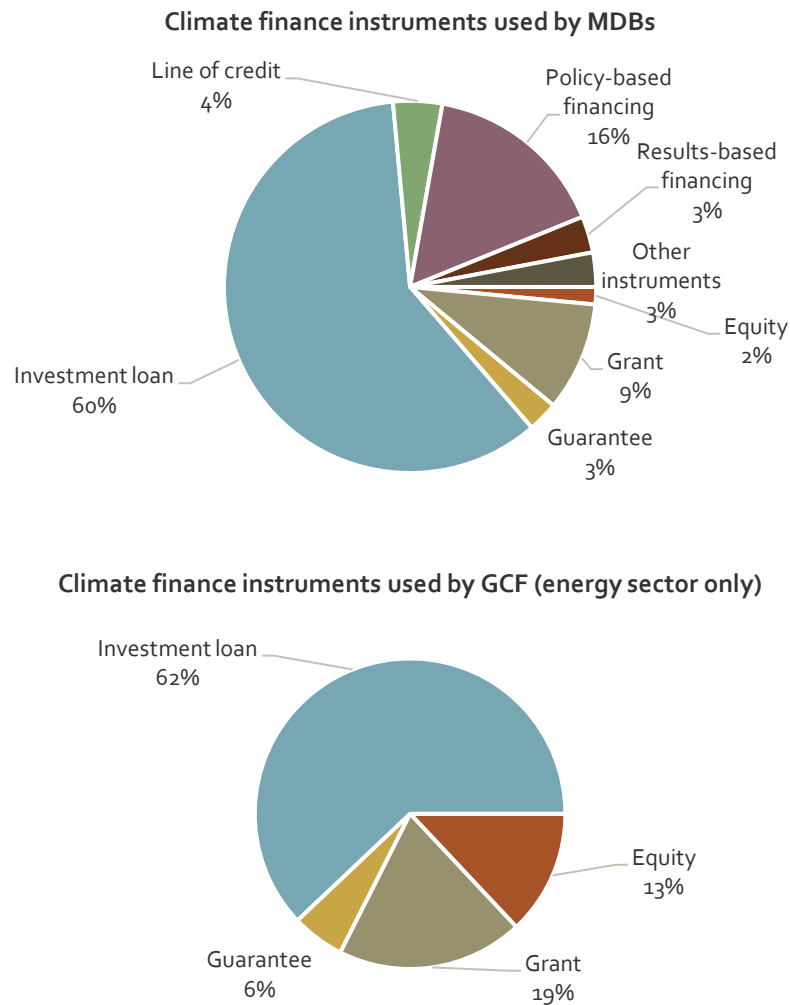
markets) and only about 5 per cent with MDB-managed external resources (such as, potentially, GCF funds).

63. The 10 MDBs listed in the report represent the most important MDB climate finance players, with the exception of the Inter-American Development Bank, which in 2022 deployed USD 1.1 billion in energy sector investments in Latin America and the Caribbean (USD 729 million in renewable energy, USD 213 million in buildings, public installations and end-use energy efficiency, and USD 163 million in adaptation investments in energy transport and other built environment infrastructure) (Morandi and Lewis, 2023).

2. CLIMATE FINANCE INSTRUMENTS

64. Development organizations utilize a wide range of financial instruments. EIB reports the following categories of financial instruments, based on aggregated information from MDBs (European Investment Bank, 2023):
 - Equity
 - Grants
 - Guarantees
 - Investment loans
 - Results-based financing
 - Lines of credit
 - Policy-based financing
 - Other structured instruments
65. The GCF uses all of these instruments apart from policy-based financing and can also structure other instruments tailored to the particular needs of AEs.
66. Due to limited access to grant funding (unlike the GCF), MDBs mainly use reimbursable financial instruments, such as loans and guarantees, to deploy climate finance in the market. Loans form about 65 per cent of their climate finance portfolio, whereas grants account for only 9 per cent (European Investment Bank, 2023). A comparison with the GCF's energy sector portfolio indicates that while MDBs have a similar proportion of investment loans in their climate portfolios (we lack aggregated energy sector specific data) to the GCF, the GCF has a proportionately larger share of grants, guarantees and equity instruments in its energy sector portfolio (Figure 2–4).

Figure 2–4. Climate finance landscape by financial instruments: comparison between MDBs (in 2022) and the GCF (in 2023)



Source: IEU DataLab; European Investment Bank (2023)

67. During key informant interviews, AEs and other development agencies reported that the GCF was by far the largest source of grant funding they had access to. Alternative grant sources (such as the European Union, the Global Environment Facility (GEF), *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) and the Climate Investment Funds (CIF)) are able to provide grants only in limited amounts. This in turn restricts the ability of MDBs to address certain market barriers and to provide tailored financial solutions in developing countries – in particular, in sub-Saharan Africa and SIDS. This restriction is even more pronounced when it comes to climate investments in SIDS and sub-Saharan Africa, where governments have limited borrowing capacity, and the markets need concessional financial instruments to overcome existing barriers.

C. THE GCF’S APPROACH TO THE ENERGY SECTOR

68. The first reference to energy in GCF documents appeared in relation to B.04, in June 2013. The document GCF/B.04/03, titled “Business Model Framework: Objectives, Results, and Performance Indicators”, laid out potential priority results areas. Under the theme of mitigation, these included

“providing households with access to low-carbon, modern energy” and “supporting the development, transfer and deployment at scale of low-carbon power generation”.

69. At B.07, in 2014, as a part of the *Initial Results Management Framework of the Fund*,⁸ the Board expanded the 2013 scope of the “Energy generation and access” results area beyond households to “increased low-emission energy access and power generation”. By calling for “increased energy efficiency in buildings, cities and industries”, the Board also included energy efficiency as a GCF priority results area for the first time.⁹
70. Three strategic plans have been articulated for the GCF to date, the first two covering the period up to the present and the third addressing the next four years:
 - *Initial Strategic Plan for the GCF* (which covered the period 2015–2019): Creating the building blocks. Being co-financer of projects and building policy frameworks and business processes from the ground up. The operating model was based on a “first come, first served” approach and second-level appraisal.
 - *Updated Strategic Plan for the Green Climate Fund: 2020–2023*: Aligning the building blocks. Being co-investor and completing policy frameworks and digitalizing processes. The operating model was based on partial prioritization of projects and second-level appraisal.
 - *Strategic Plan for the Green Climate Fund 2024–2027*: Aligning the building blocks. Being a partnership hub/convenor and optimizing policies and processes for access.
71. The first two strategic plans had limited sector-specific focus and did not set targets for the energy sector, whereas the upcoming plan more explicitly addresses the energy sector, among others (Table 2–1). Analysis and findings related to GCF strategies are presented in Chapter 3.B.

Table 2–1. Energy sector approach in GCF strategic plans

PLAN	YEARS	ENERGY SECTOR SPECIFIC APPROACH
Initial Strategic Plan for the GCF	2015–2019	The plan required GCF investments to “achieve a balanced allocation between mitigation and adaptation” and that projects/programmes should support “cutting-edge climate technologies, characterized by the highest levels of mitigation/adaptation ambition”. It does not mention individual sectors.
Updated Strategic Plan for the GCF 2020–2023	2020–2023	This plan again stated that GCF investments should foster “balancing and optimizing synergies between mitigation and adaptation” but did not differentiate between sectors. It set a threshold for the expected mitigation portfolio “reduction/avoidance of over 460 million tons of carbon dioxide-equivalent (tCO ₂ e) for each USD 1 billion invested”. This number is taken from the initial resource mobilization (IRM) portfolio at the date of the adoption of the plan. This updated strategic plan also promotes catalysis of public and private financing sources towards mitigation, with specific actions related to increase the engagement of the private sector. The plan guides the GCF to prioritize “the most impactful investments for countries in their respective national and regional contexts informed by areas of high mitigation potential”. The plan also developed results areas to help partners develop more aligned and higher-quality proposals.
Strategic Plan for the GCF	2024–2027	Particular sectors of interest are covered, including energy, transport and infrastructure.

⁸ GCF/B.07/04, titled “Initial Results Management Framework of the Fund”.

⁹ These initial results areas are now operationalized as “Energy access and generation” and “Buildings, cities, industries, and appliances”. Further details are available at <https://www.greenclimate.fund/theme/mitigation>.

PLAN	YEARS	ENERGY SECTOR SPECIFIC APPROACH
2024–2027		<p>Specific targets are set for the energy sector over the programming period: on clean energy for increased energy access by increasing the share of renewable energy in the energy mix; on low-emission infrastructure; and on clean and efficient energy end-use for transport, building and industry.</p> <p>There is emphasis on private sector involvement, highlighting de-risking instruments to “establish track record for wider market-driven diffusion”. Private financing targets for support to energy access and transport are set, among others. It makes little reference to sectoral priorities above and beyond the targeted results of the second updated strategic plan, which do not align with the results areas.</p>

Source: Compilation from IEU DataLab.

1. GCF RESULTS AREAS

72. Based on the initial results management framework (RMF) (2014) and the integrated results management framework (IRMF) (2021), the GCF has been using **eight results areas** to assess and monitor projects. Three of them concern the energy sector:
- **“Energy generation and access”** mainly relates to the installation of renewable energy systems. The GCF has 69 projects related to this results area, with total financing amounting to USD 3.2 billion (Green Climate Fund, 2022c). Energy generation focuses on reduction of GHG emissions in the country energy mix by increasing the renewable energy share in electricity production, and energy access focuses on beneficiaries and their ability to use modern clean energy.
 - **“Buildings, cities, industries, and appliances”** focuses on GHG emissions reduction in the urban environment using technologies such as district cooling and heating, energy efficiency measures, distributed renewable energy installations and low-emission transport. From a regulatory perspective, this results area supports policies that have an impact at local scale, such as with energy-efficient building codes. The ultimate goal of projects under this results area is to create NZE neighbourhoods.
 - **“Transport”** is a significant contributor to CO₂ emissions. Projects under this results area promote low-emission public transport, electrification of private and public vehicles, and zero-emissions fuel such as green hydrogen.
73. A fourth results area, **“infrastructure and built environment”**, should also be mentioned since “infrastructure” encompasses many sectors, including transportation, telecommunications, water and energy, and contributes to GHG emissions by relying heavily on emissions-intensive industries – particularly the production of cement and steel.
74. The other four results areas – namely “Ecosystems and ecosystem services”, “Forests and land use”, “Health, food, and water security” and “Livelihoods of people and communities” – also encompass some energy sector activities, but to a lesser extent.
75. Through these eight results areas, the GCF indicates that it is mindful of the need to facilitate climate action in the energy sector in the public, commercial and industrial sectors and of the energy sector’s need to have a strong focus on efficient productive use of energy.

2. GCF SECTORAL GUIDES

76. In 2021–2022, the GCF released 10 sectoral guides¹⁰ to clarify its expectations from projects and to provide a greater level of detail for the development of sector-specific results frameworks and impact indicators. The guides were also designed to support alignment of the GCF with country priorities for optimal impact in each sector. The GCF's *Country Programme Guidance* encourages countries to align with the GCF's Strategic Plan and relevant sectoral guides. Each sectoral guide identifies paradigm-shifting pathways and actions following four strategic pillars:
- Transformational planning & programming
 - Catalysing climate innovation
 - Mobilization of finance at scale
 - Coalitions & knowledge to scale up success
77. The energy sector priorities as identified in earlier Board documents, such as GCF/B.04/03 and GCF/B.07/04, addressed both supply- and demand-side issues and focused on the most pressing market needs of developing countries such as clean energy generation and improved energy efficiency in buildings, industries and cities.
78. There are two sectoral guides that focus exclusively on the energy sector (*Energy access and power generation*, and *Energy efficiency*). Two other sectoral guides include pathways that are directly linked to the energy sector (*Low emission transport*, and *Cities, buildings and urban systems*), while all other sectoral guides include energy as a cross-sector theme.
79. Under the *Energy access and power generation* guide (May 2022), three distinct transformational pathways aimed to deliver a significant and paradigm-shifting impact during the first replenishment period (2020–2023):
- **Low-emission power generation** focuses on generating electricity from geothermal and renewable sources in a sustainable manner and includes geothermal energy, solar and wind energy, hydropower, bioenergy and ocean energy.
 - **Efficient and reliable energy transmission, distribution, and storage** focuses on investing in grid flexibility, digitalization and storage to make power grids more capable of efficiently and reliably operating with higher shares of renewables.
 - **Promoting access to modern renewable energy** focuses on modern renewable energy for cooking, grid connections and off-grid electricity, such as green mini-grids and solar home systems, for access in a way that promotes sustainable development and climate resilience for societies while also reducing emissions.
80. Under the sectoral guide for *Energy efficiency* (September 2022), the GCF has identified the following three paradigm-shifting pathways for advancing the highest climate impact projects while supporting country needs:
- Scaling up industrial energy efficiency
 - Enhancing “space” energy efficiency
 - Catalysing rapid market switch to highest-efficiency appliances/equipment

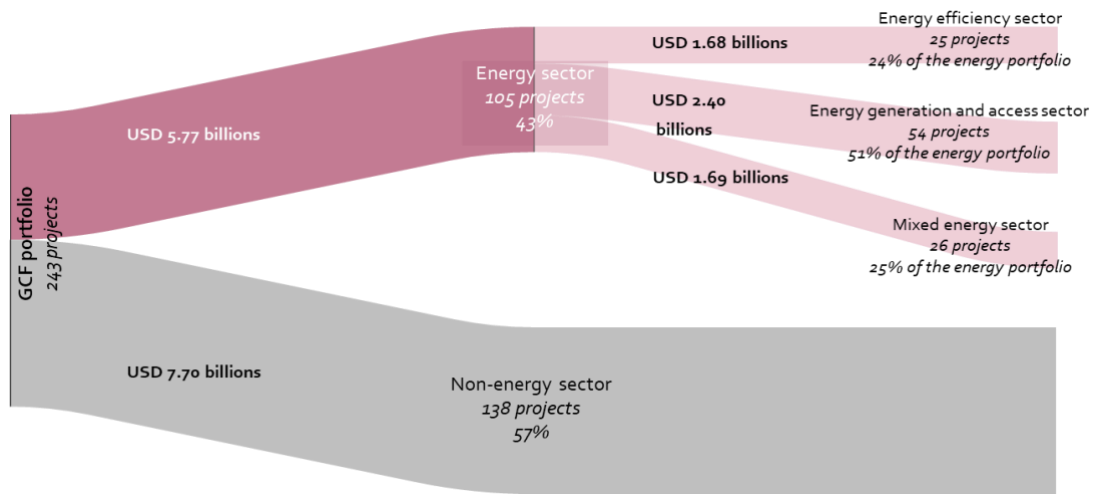
¹⁰ These being *Agriculture and food security*; *Cities, buildings and urban systems*; *Climate information and early warning systems*; *Ecosystems and ecosystem services*; *Energy efficiency*; *Energy access and power generation*; *Forests and land use*; *Health and wellbeing*; *Low emission transport*; and *Water security*. The guides are available at <https://www.greenclimate.fund/projects/sectoral-guides>.

81. The evaluation considered the above two guides as the GCF's sector guidance in the energy sector, mapping to the "Energy generation and access" results area and the "Buildings, cities, industries and appliances" results area.
82. Nevertheless, in the sectoral guide for *Cities, buildings and urban systems* (September 2021), the GCF has identified four paradigm-shifting pathways, two of which concern the energy sector:
 - Decarbonization of urban energy systems by scaling up distributed renewable energy
 - Energy efficiency in building stock through retrofits of existing buildings, and construction of new, green buildings, with more energy-conscious constructions using ecosystems-based approaches where appropriate
83. Similarly, under the sectoral guide for *Low emission transport* (August 2022), the GCF has identified three paradigm-shifting pathways, one of which concerns the energy sector: rapidly electrifying transport systems throughout the entire value chain with integrated policy planning, innovation in technology and business models to catalyse rapid and systemic electrification (including charging infrastructure) enabled by renewable energy power generation.
84. Efficient water pumping is mentioned in two sectoral guides – namely, *Water security* and *Agriculture and food security*. In the end, as a cross-sectoral theme, energy and its related pathways are mentioned in all 10 sectoral guides.

D. PROJECT PORTFOLIO OVERVIEW

85. At the start of the GCF deployment, the energy sector was predominant. The sector's share of the portfolio started decreasing in 2020 and has continued doing so over time. Energy is still an important part of the total GCF portfolio, accounting for 43 per cent of overall financing to date, at USD 5.77 billion.
86. Based on the IEU's recategorization of the current 243-project portfolio of the GCF, energy represents a large share of the GCF energy portfolio. Of the 105 identified energy projects, 54 (51 per cent) are in the energy access and power generation sector and a large share of the mixed energy sector projects include renewable energy generation (Figure 2–5). Energy-specific activities represent 69 per cent of energy sector project investments. The remaining 31 per cent is related to activities in other sectors such as health, water security, ecosystem services, agriculture and forestation. The energy efficiency sector includes all end-use sectors from buildings to transport. In all, seven simplified approval process (SAP) proposals and 105 FPs approved by the GCF Board contain energy activities.

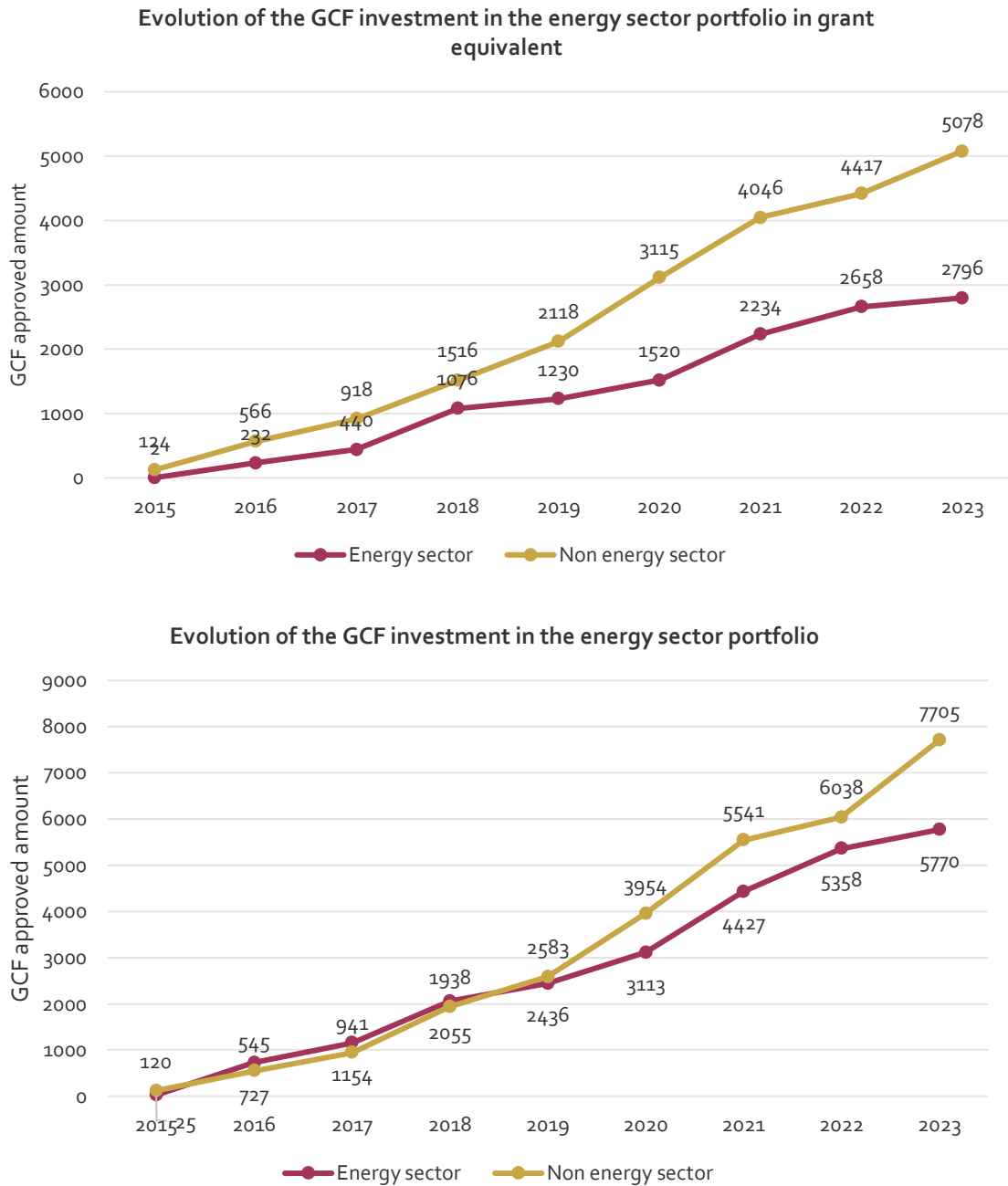
Figure 2–5. GCF energy portfolio investment by energy sector and subsector, in grant-equivalent terms



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

87. Until 2019, the GCF projects budget was heavily dedicated to energy. The GCF began to diversify starting from 2020. In grant-equivalent terms, the energy sector proportion of the GCF budget represents 55 per cent of the cumulative approved amount up to October 2023 (Figure 2–6).

Figure 2–6. Evolution of the GCF investment, in grant-equivalent and in nominal terms
(USD million)

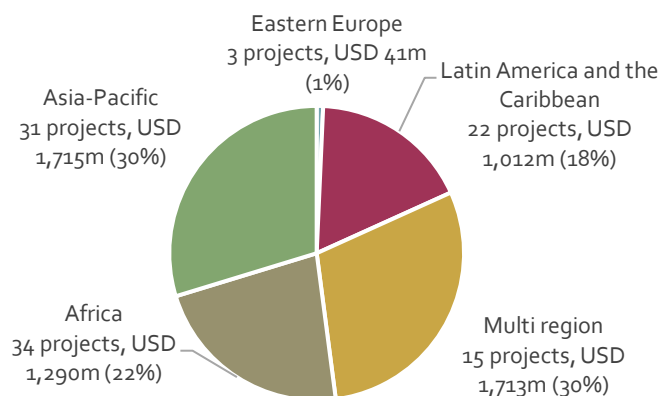


Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

88. The regional distribution of the GCF energy project portfolio is roughly proportional to the overall GCF portfolio. The evaluation does not find corporate guidance on sector-specific regional priorities, and therefore it is not possible to make further assessments on the regional distribution of the energy portfolio.
89. Except for multi-region projects, Asia-Pacific and Africa stand out as the regions that have attracted more GCF energy investment (respectively 30 per cent and 22 per cent) and also more energy sector projects (respectively 31 per cent and 34 per cent) (Figure 2–7). It can be noted that average project investment size in Africa is smaller than in the Asia-Pacific region (likely explained by the larger

population in Asia: 4.8 billion versus 1.5 billion in Africa, as well as larger average and median populations per country). Latin America and the Caribbean and Eastern Europe together have attracted only 18 per cent of the GCF's energy investments, for 25 projects. The level of energy investment in the Asia-Pacific and Africa regions is reflective of their respective energy sector challenges (energy access) and population.

Figure 2–7. Distribution of GCF investment in the energy sector by region

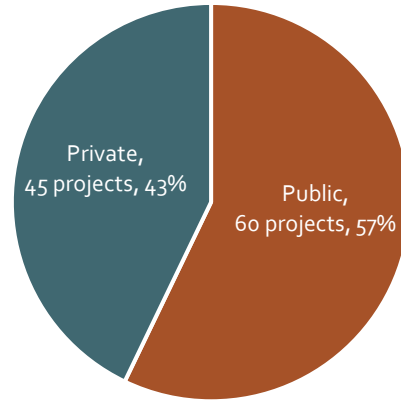


Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

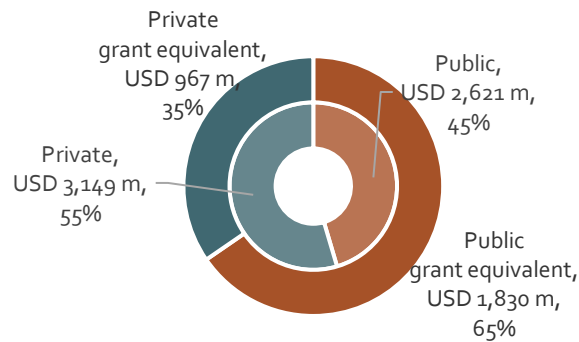
90. To properly analyse the GCF involvement in vulnerable countries, the 15 multi-region projects have been excluded from the analysis, which is shown in Volume II of the report. The GCF has invested in at least 55 projects in vulnerable countries, representing 61 per cent of all single-country energy sector projects. The total investment in vulnerable countries only amounts to USD 2.173 million, representing 34 per cent of total investment, excluding multi-region projects. Within the vulnerable countries category, the GCF has invested in energy sector projects in African States (33 projects), LDCs (38 projects) and SIDS (18 projects), although due to the overlapping figures (a country may fall into more than one category), the proportion may be misleading.
91. As shown in Figure 2–8, the number and budget of energy projects are almost equally distributed across the public and private sectors. In grant-equivalent terms, the Division of Mitigation and Adaptation (DMA) has a larger share (65 per cent) than the Private Sector Facility (PSF). The energy sector is highly represented in GCF private sector investment, with more than 70 per cent in grant-equivalent of the total GCF investment via the PSF (see section E).

Figure 2–8. Share of projects by division and sector, in grant-equivalent terms*

Distribution of the energy project per sector



Distribution of the GCF investment in the energy sector per sector

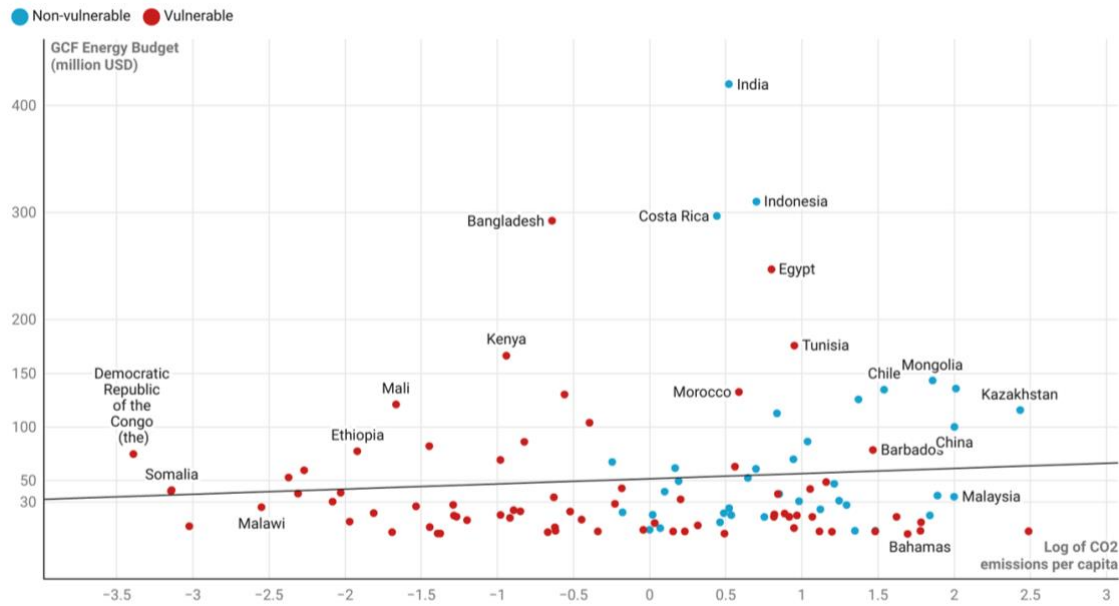


Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

Note: * 'Private' refers to the GCF PSF and 'public' to the GCF DMA.

- The highest GHG-emitting developing countries are not necessarily the countries where the GCF is targeting its support. Figure 2–9 below illustrates the GCF investment in energy and the level of CO₂ emissions per country. No direct correlation can be drawn between GCF investment in energy and CO₂ emissions per capita, which is logical since the GCF does not have an objective to target such countries and project origination is country driven.

Figure 2–9. GCF investment and GHG high-emitting countries 2015-2020



Source: IEU DataLab, WB Open Data CO₂ emissions per capita (metric tons). Created with Datawrapper.
Note: Vulnerable countries include SIDS, LDCs and African States. The trend line shown applies to both vulnerable and non-vulnerable countries.

E. THE PRIVATE SECTOR

93. Private sector engagement is an important mandate of the GCF energy portfolio, which mostly focuses on mitigation, with an increasing number of projects at the regional level.
94. The GCF has a clear mandate to collaborate with the private sector, as stipulated by the Governing Instrument. The Private Sector Strategy¹¹ aims to meet priorities set out in the Governing Instrument and Board policies, notably in terms of thematic and geographic balance; prioritizing developing countries under the UNFCCC that are particularly vulnerable to the adverse effects of climate change, including LDCs, SIDS and African States; paying specific attention to adaptation activities; promoting the participation of local private sector actors in developing countries, including small and medium-sized enterprises and local financial intermediaries; and unlocking private finance at scale, including from institutional investors.
95. The updated strategic plan for the 2020–2023 period recognizes identifying and increasing private sector engagement potential as a key action and sets out commitments to build NDA and private sector capacity at the country level through the RPSP, alongside a focus on de-risking.
96. The *Strategic Plan for the Green Climate Fund 2024–2027* also places an emphasis on private sector involvement, mentioning de-risking instruments to “establish [a] track record for wider market-driven diffusion”. Targets for private financing support to energy access and transport are set, among others.
97. PSF energy-related projects constitute 55 per cent of the GCF energy sector portfolio, totalling USD 3.1 billion in approvals (USD 926 million in grant-equivalent terms). Among these projects, 42 per cent contribute to energy access and generation, 32 per cent have mixed energy purposes, and only 8 per cent focus on energy efficiency.

¹¹ Available at <https://www.greenclimate.fund/document/private-sector-strategy>.

Chapter 3. RELEVANCE OF THE GCF APPROACH IN THE ENERGY SECTOR

KEY FINDINGS

- The GCF energy approach is generally aligned with UNFCCC principles. The UNFCCC advocates for just transition principles, which can lead to more equally shared benefits in energy projects. The GCF is in the process of integrating just transition principles into its approach.
- The target of 460 million tCO₂e reduced/avoided for each USD 1 billion invested is not met at the energy portfolio level for mitigation projects, because it was highly ambitious.
- Although the new strategic plan for the 2024–2027 period sets more specific targets for the energy sector, their achievement will prove difficult to measure in practice.
- To date, the GCF does not have a discretely stated energy sector specific strategy and/or policy, which limits full understanding of the GCF's energy approach both internally and by external stakeholders.
- While the GCF uses two approaches for classifying projects – results areas and sectoral guidance – these approaches are not aligned or standardized. As a result, the classification of projects with energy components is not always appropriate.
- The relationship between GCF results areas and sectoral guides is not one-to-one. Uptake of the energy sectoral guides is so far inconsistent; the mapping of projects under sectoral guides lacks standardization, and cross-referencing in the sectoral guides lacks a systematic approach.
- The technology and “supply and demand” approaches of the energy-related sectoral guides lack coordination and comprehensiveness.
- Energy projects can have impact in both adaptation and mitigation. However, there is no clear understanding of what can be considered as adaptation in energy projects.
- NDA involvement is a key driver to ensure the alignment of GCF projects and country strategies regarding energy transition. GCF project alignment with country priorities may be challenging in multi-country projects.

A. STRATEGIC GUIDANCE FROM THE UNFCCC

98. **The GCF energy approach is generally aligned with UNFCCC principles.**
99. The GCF is guided by the UNFCCC principles and provisions, and focuses on four main areas for clean energy transition: (i) energy generation from renewable sources such as wind, solar, geothermal, hydro and sustainable bioenergy; (ii) efficient and reliable energy transmission, distribution and storage; (iii) promoting access to clean energy in a way that promotes sustainable development and climate resilience while reducing emissions; and (iv) low-carbon-emission transport. The *Strategic Plan of the Green Climate Fund 2024–2027* confirms that the GCF is to “support developing countries in the implementation of the UNFCCC and Paris Agreement within the evolving climate finance landscape”.¹²
100. The UNFCCC has identified the decarbonization of the energy sector as one of their thematic areas of the “Climate Action Pathways” (United Nations Framework Convention on Climate Change, n.d.). It focuses on four main decarbonization pathways to fully decarbonize the energy sector by 2050: “aggressive efficiency measures, a mass expansion of renewables, electrification of end-use sectors and a shift from fossil to zero-emission liquid and gaseous fuels” (Global Climate Action and Marrakech Partnership, 2020).
101. The UNFCCC energy pathway is divided into three main “subsectors”:
- **Decarbonized power** through a renewable-based power system is fully aligned with GCF strategy.
 - **Sectoral integration** using green hydrogen and end-use solutions is also aligned with the GCF approach in the energy sector.
 - **Structural change** working to phase out coal, oil and gas is generally aligned with GCF strategy; some actions specifically tackling regulatory support to the phase out of coal, oil and gas are not clearly indicated in the GCF sectoral guides – for example, policies on fuel import and regulation on reduction of fossil fuel subsidies.
102. The UNFCCC transport pathway has six impact areas. Four GCF pathways – low-emission transport; resilient transport; improve land transport; and improve shipping – are fully aligned with UNFCCC impact areas.
103. **The UNFCCC advocates for a just transition as it can lead to more equally shared benefits in energy projects. The GCF is in the process of integrating just transition principles into its approach, so it is premature to expect results.**
104. The UNFCCC acknowledges that the current global move away from fossil fuel dependence can greatly impact workers and communities, and that historical pathways and current contexts are determining factors in establishing differentiated roles for national and international agents in the global transition (United Nations Framework Convention on Climate Change, 2023b). A just transition is required to enhance job creation and economic diversification towards a climate-resilient and low-emission economy (United Nations Framework Convention on Climate Change, 2023b),¹³ ensuring that no one is left behind.
105. The UNFCCC calls for a decentralized implementation of the concept of just transition, operationalized through collective and participatory decision-making (United Nations Framework Convention on Climate Change, 2023b).¹⁴ This in turn demands increased investment in capacity-

¹² Point (b) of paragraph 5.

¹³ Paragraph 136.

¹⁴ Paragraph 25.

building for the most vulnerable countries (United Nations Framework Convention on Climate Change, 2023b).¹⁵ The UNFCCC also calls for international cooperation to end fossil fuel subsidies, and joint investment in clean technology development, transfer and innovation in its strategy to address the economic barriers to just transition.

106. The UNFCCC recorded 26 concrete examples of just transition initiatives in a recent report (United Nations Framework Convention on Climate Change, 2023a), 15 of which stem from the energy sector, and of which two are identified as being concerned with energy efficiency in the building sector. The other 13 projects are not identified as pertaining to any specific subsector. In the energy sector's uptake of renewable energy, the report highlights how trade unions can partake in the just transition for workers, and how increased energy access through solar technologies can benefit women.
107. The GCF has been committed to a just transition since its inception, as expressed through various capacity-building activities targeting vulnerable countries and the integration of environmental and social safeguards (ESS) and gender and Indigenous Peoples policies in FPs. More recently, the GCF integrated a just transition principle in its strategic plan for the 2024–2027 period. As this just transition principle has not been assessed in projects at the proposal or monitoring stages, there is at present no evidence on the GCF's compliance with just transition principles for the energy sector.

B. THE GCF'S FRAMEWORK AND STRATEGIES IN THE ENERGY SECTOR

108. **The target of 460 million tCO₂e reduced/avoided for each USD 1 billion invested is not met at the energy portfolio level for mitigation projects, because it was highly ambitious.**
109. Three GCF strategic plans are summarized in Chapter 2. In the second, covering 2020 to 2023, one portfolio-level objective was set at 460 million tCO₂e reduced/avoided for each USD 1 billion invested in mitigation.¹⁶ This objective is not a threshold strictly applied to each energy mitigation project, but a portfolio guiding target. To reach this target at the portfolio level, mitigation projects must, on average, exceed 460 million tCO₂e reduced/avoided for each USD 1 billion invested. Using the overall investment of energy mitigation projects (GCF investment and co-financing), only one project is expected to reach the target (FP164). Calculating the ratio of million tCO₂ reduced for each USD 1 billion invested only by the GCF (GCF investment), only 14 projects of the GCF energy portfolio reach the target.¹⁷ The GCF energy mitigation portfolio reaches a ratio of 227 million tCO₂e reduced/avoided for each USD 1 billion invested by the GCF and 55 million tCO₂e reduced/avoided for each USD 1 billion invested when taking into account GCF investment and co-financing. The target is very ambitious since it represents investing only USD 2.17 for each avoided tCO₂e, well below the shadow carbon pricing used by the international community of at least USD 50/tCO₂e avoided. Cost-effectiveness is analysed in more details in Chapter 4.
110. **The *Strategic Plan for the Green Climate Fund 2024–2027* sets targets for the number of countries supported in several energy subsectors and calls for a focus on “hardest-to-reach” countries and “hard-to-abate” sectors. “Hardest-to-reach” and “hard-to-abate” do not yet have clear definitions, however.**

¹⁵ Paragraph 132.

¹⁶ Portfolio-level IRM results: 460 million tCO₂e reduced/avoided for each USD 1 billion invested in mitigation; and 166 million beneficiaries with increased resilience for each USD 1 billion invested in adaptation (Green Climate Fund, 2020).

¹⁷ FP027, FP050, FP070, FP071, FP083, FP098, FP099, FP115, FP152, FP154, FP164, FP197, FP213, SAP014.

111. The strategic plan for the 2024–2027 period includes several specific targets for the energy sector over its programming period:
- Clean energy: 20 to 30 developing countries supported in increasing renewable energy in their energy matrix. In the last programming period (2020–2023), 13 clean energy projects¹⁸ covered more than 30 countries, mainly due to the six regional projects (covering multiple countries) in Africa.
 - Energy efficiency: 18 to 25 developing countries to be supported for electrification and reducing energy consumption in transport, building and industry. In the last programming period (2020–2023), four projects in transport¹⁹ cover 10 countries and six energy efficiency projects²⁰ have been developed across 19 countries.
112. The 2024–2027 energy sector targets are in line with the last programming period. There are no quantitative GHG emission reductions or high-emitting countries (see Figure 2–9 above) targeted. There is a focus on “hardest to reach” developing countries and “hard-to-abate” sectors. There is not a specific definition for “hardest to reach”, which makes tracking difficult, and the definition of “hard-to-abate” is not consistent within the MDBs and climate funds. Generally, “hard-to-abate” sectors include heavy industry and heavy-duty transport (Energy Transitions Commission, 2018). Past programming did not have these priorities, and almost no projects tackle those sectors.
113. Another target for the energy sector in the new strategic plan concerns supporting 900 to 1,500 “local private sector early-stage ventures and MSMEs” on adaptation and the energy access and transport sectors. The assessment of this target will require internal tracking of such support.
114. **To date, the GCF does not have a discretely stated energy sector policy or strategy, which limits full understanding of the GCF energy approach both internally and by external stakeholders.**
115. Many MDBs and multilateral funds have one document presenting their approach in the energy sector in a form of a strategy or policy, but the GCF does not. Having such a stated overall approach facilitates comprehension of the energy approach of an institution, internally and externally.
116. **The relationship between GCF results areas and sectoral guides is not one-to-one.** There are 10 sectoral guides that cover the eight results areas, but some sectoral guides cover more than one results area (i.e. results areas and sectoral guides do not always coincide). Although there is no sectoral guide for the results area of “Infrastructure and built environment”, a sectoral guide was released to cover *Energy efficiency*, which is not a results area but is included in the results area of “Building, cities, industries, and appliances”.
117. The sectoral guides are provided as tools and have not been approved by the Board. Their structure, and especially the cross-referencing between guides, has evolved over time. Navigation between the guides can be confusing since some specific energy-related issues can be found in more than one guide and may have changed sectoral guide over time. Only referring to the *Energy access and power generation* and *Energy efficiency* sectoral guides for the energy sector approach would be misleading. Important energy-related issues identified as paradigm-shifting pathways in several other sectoral guides are clearly outlined in Table ES-1 in the *Energy efficiency* guide as well as in Table 3–1 below, but not in the *Energy access and power generation* guide, where cross-referencing is weak and incomplete. *Cities, buildings and urban systems*, the oldest sectoral guide, does not refer to other sectoral guides, because it has not been updated since September 2021. The issuance of the

¹⁸ Projects with “Energy access and power generation” results area over 50 per cent.

¹⁹ Projects with “Low emission transport” results area over 50 per cent.

²⁰ Projects with “Buildings, cities, industries and appliances” results area over 50 per cent.

Water security sectoral guide has made it clearer how to select the proper sectoral guide to ensure compliance of an energy efficiency project in water infrastructure. Even with this effort from the GCF Secretariat to inform stakeholders, it is still a struggle for AEs when preparing energy project proposals with countries. In general, the sectoral guides are not well known by the energy sector staff in IAEs. Only GCF focal points and teams dedicated to preparing or revising concept notes and FPs are familiar with the sectoral guides and find them valuable for ensuring FPs' alignment and compliance.

118. Table 3–1 below shows energy-related pathways for each of the sectoral guides, highlighting energy's importance for climate mitigation and adaptation across all sectors.

Table 3–1. Energy-related paradigm-shifting pathways in the 10 GCF sectoral guides

RESULTS AREAS (NO. OF AREAS)	SECTORAL GUIDE	ENERGY-RELATED PARADIGM-SHIFTING PATHWAYS
Health, food, and water security Livelihoods of people and communities (2)	Agriculture and food security	Agribusiness cold supply chains for food processing and food waste reduction Efficient water pumping and irrigation practices
Buildings, cities, industries, and appliances Infrastructure and built environment Livelihoods of people and communities (3)	Cities, buildings and urban systems	Climate-resilient and resource-efficient building design practices in urban areas Resilient cities and urban systems to reduce heat island effects Efficient district heating and cooling networks
Infrastructure and built environment Livelihoods of people and communities (2)	Climate information and early warning systems	Weather monitoring and climate information systems Internet of things and cloud storage applications for weather and climate data
Ecosystems and ecosystem services Health, food, and water security Livelihoods of people and communities (3)	Ecosystems and ecosystem services	Ecosystem-based approaches to reduce cooling demand for adaptation to heat waves
Buildings, cities, industries, and appliances Energy access and power generation Infrastructure and built environment (3)	Energy efficiency	Industrial energy, material, and resource efficiency practices Energy-efficient appliances, standards, and labelling for consumer and small business needs Efficient cooling applications for buildings Efficient energy system planning practices coupling electricity, heating, air-conditioning, and ventilation requirements Energy-efficient building and city-district design
Buildings, cities, industries, and appliances Energy access and power generation Infrastructure and built environment (3)	Energy access and power generation	Electricity generation from renewable energy resources Efficient and reliable energy transmission and distribution networks for high penetration of renewable energy Modern renewable energy access, including clean cooking

RESULTS AREAS (NO. OF AREAS)	SECTORAL GUIDE	ENERGY-RELATED PARADIGM-SHIFTING PATHWAYS
Forests and land use Health, food, and water security Livelihoods of people and communities (3)	Forests and land use	Efficient biomass usage and conversion practices for electricity, heating, cooling, and cooking needs Efficient biomass usage and conversion practices for industrial uses
Buildings, cities, industries, and appliances Health, food, and water security (2)	Health and wellbeing	Cold supply chains for medicine and vaccines Efficient, long-term cold storage and logistic practices Health services preparedness, including cooling solutions, for extreme events, such as heatwaves
Infrastructure and built environment Transport (2)	Low emission transport	Vehicle fuel efficiency standards Efficient electric mobility applications Efficient fuelling and charging infrastructure
Buildings, cities, industries, and appliances Health, food, and water security Infrastructure and built environment Livelihoods of people and communities (4)	Water security	Efficient water pumping systems and networks for both municipal water supply and irrigation

Source: Green Climate Fund (2022c; 2022g)

119. It may be difficult to classify an energy sector project according to a single sectoral guide since several of them may and should apply. The above table demonstrates that it would be wrong to state that the guides for *Energy efficiency* and *Energy access and power generation* should be considered as the totality of the GCF's sectoral guidance in the energy sector, corresponding to the "Energy generation and access" results area and the "Buildings, cities, industries, and appliances" results area. All sectoral guides should be considered as contributing to the GCF's sector guidance on energy, especially the *Cities, buildings and urban systems* guide in which three out of four paradigm-shift pathways are related to energy.
120. Energy efficiency is clearly shown in Table 3–1 as cross-sectoral, since improving the efficiency of energy-consuming equipment and technologies can be considered in all sectors. Energy efficiency policies are key to reaching the expected reduction in energy consumption. The GCF is supporting those policies mainly through its Readiness programme. Reductions in GHG emissions in agriculture, industry, transport, buildings, public services (including water systems) and urban areas can be achieved through a combination of energy efficiency and conservation, transition to low-emissions technologies and energy carriers (Intergovernmental Panel on Climate Change, 2023), fuel switching and the inclusion of renewable energy generation subsequently.
121. **While the GCF uses two approaches for classifying projects – results areas and sectoral – these are not aligned or standardized. The classification of projects with energy components is not always appropriate.**
122. The GCF results areas approach was developed in 2020, covering eight areas with major potential to deliver impact. Then, between 2021 and 2022, the GCF released 10 sectoral guides. These two approaches for project classification are currently used simultaneously. As the number of results areas does not correspond to the number of sectoral guides, the share of investment does not always

correspond between results areas and sectoral guides, even for those that include the same subsectors – for example, energy generation and energy access.

123. Based on the analysis of the energy projects database of 105 projects, 12 (FP001, FP007, FP023, FP026, FP040, FP041, FP058, FP059, FP061, FP089, FP136 and SAP018) are not considered under any of the three GCF results areas related to energy (“Energy generation and access”, “Buildings, cities, industries, and appliances” and “Transport”), although they do have energy activities in their proposals. However, energy components of these projects are limited and often more related to adaptation. The energy-related budget is less than 1 per cent for half of these projects, and 1–10 per cent for three of them, meaning that for at least 75 per cent, the classification can be considered as appropriate. However, for the remaining three projects, with the energy activities budget representing a more significant part of the overall budget, classification is not fully appropriate.
124. Several findings were identified for the use of the sectoral guides by the GCF Secretariat and stakeholders.
125. **Uptake of the energy sectoral guides is so far inconsistent. Mapping of projects under sectoral guides lacks standardization. Cross-referencing in the sectoral guides lacks a systematic approach.**
126. Based on interview findings, the energy sectoral guides are not widely known or used as reference documents, because they are quite new to the GCF toolkit. Dedicated GCF teams in MDBs do know the guides well and use them for ensuring compliance of project proposals before submitting them to the GCF. The fact that the structure of the guides is generally standardized should facilitate their navigation by users in the future, although the first guides are not fully updated and harmonized with the later ones.
127. The GCF Secretariat has mapped all FP and SAP projects²¹ under the sectoral guides, validated by the sectoral leads. Project activities corresponding to specific results areas with matching sectors are directly mapped to those sectors. Where results accrue to multiple sectors, the project is mapped to those sectors and the project finance (both GCF and co-funding) equally apportioned to the corresponding sectors and pathways. However, mapping under the sectoral guides is not currently standardized, which may lead to errors in tagging. For example, in the energy sector portfolio reconstructed by the IEU DataLab, 16 projects with energy activities were not tagged under any sectoral guide related to energy, although five of them fall under the “Energy generation and access” results area. This could lead to underreporting of GCF investments in the energy sector.
128. Currently, the FP / concept note templates do not include any sectoral guide reference. The Secretariat is working on updates to correct this.
129. Energy is a transversal thematic area in the GCF. Cross-references are clearly stated in tables in all sectoral guides. It should be noted that the cross-references are not systematically harmonized under each sector. For example, Table ES-1 in the sectoral guide for *Energy access and power generation*, which presents cross-references with the other sectoral guides, is completely different from the one in the *Energy efficiency* guide. Under the cross-sectoral issues associated with the sectoral guide for *Health and wellbeing*, only climate-resilient health infrastructure is mentioned in one, and efficient cold supply and storage is mentioned in the other. This cross-sectoral referencing does not cover all types of projects – for example, water infrastructure is missing but water pumping is mentioned under *Agriculture and food security*. Similarly, clean cooking is only mentioned under the *Energy*

²¹ The GCF SAP technical guideline for renewable energy was also developed to assist stakeholders in the creation of small renewable energy projects. It outlines some key components, indicative activities, and pathways to impact for such projects.

access and power generation sectoral guide, while it should also be referenced under the *Forest and land use* guide.

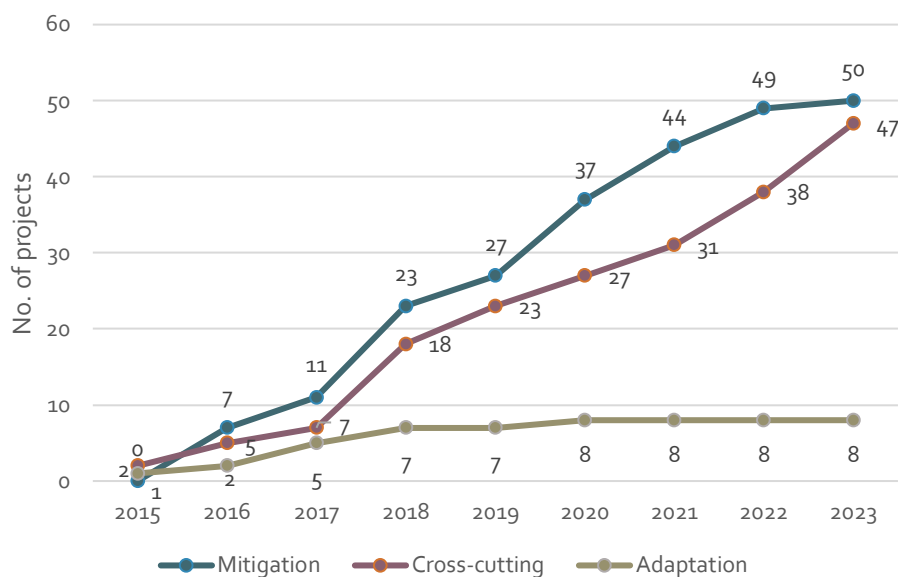
130. The *Health and wellbeing* sectoral guide includes one example of a project for which the reduction of CO₂ emissions is directly related to the reduction of fossil fuel consumption: FP070, Global Clean Cooking Program – Bangladesh. Another example promotes cooling facilities in which most of the CO₂ reduction is linked to energy efficiency in cooling systems (FP177, Cooling Facility). The two examples are correctly tagged to the energy-related sectoral guide.
131. In the *Agriculture and food security* sectoral guide, energy is tackled through biomass, renewable energy for irrigation, energy efficiency, and renewable energy in the food value chain. The cross-referencing approach in this sectoral guide seems generally appropriate. However, the portfolio analysis shows some discrepancies between project activities and their mapping and tagging, depending on the sector of activities (see explanation in the previous finding).
132. **The technology and “supply and demand” approaches of the energy-related sectoral guides lack coordination and comprehensiveness.**
133. A detailed review of the content of each sectoral guide relevant to the energy sector has been performed, with several findings, as follows:
 - **Technologies and sectors:** The sectoral guides on *Energy access and power generation* and *Energy efficiency* aim to capture the main technologies to mitigate climate change related to energy supply and use. For example, the *Energy access and power generation* sectoral guide addresses the renewable energy technologies widely used and with highest potential: “geothermal energy, solar and wind energy, hydropower, bioenergy, and ocean energy”.
 - However, not all technologies, sectors and delivery mechanisms that might be financed are included in the sectoral guides. In particular, some specific demand-side applications of renewable energy and energy efficiency, such as solar water pumping to replace grid electricity or diesel, are not captured or linked with other sectoral guides where these applications are mentioned.
 - Public services energy usage, with high potential of energy savings, is not clearly mentioned in either the *Energy efficiency* or *Cities, buildings and urban systems* guides. It is presented only in one example, and street lighting is mentioned in a table but not in the “paradigm-shifting pathways in the urban sector”. Public lighting and water/wastewater treatment are key sectors in the energy landscape. In the *Water security* sectoral guide, cross-sectoral issues related to energy and water are mentioned but there is a lack of coordination with the other sectoral guides on energy efficiency in public services.
 - **Approach to energy efficiency:** Energy efficiency is not one of the eight results areas, which does not favour its recognition as an important element of the GCF’s energy approach. The *Energy efficiency* sectoral guide undersells its transformational potential, which according to the IPCC’s reporting (2022) can account for 40 per cent of the cumulative CO₂ emissions reductions by 2050 in a 1.5°C pathway.
 - Several types of energy efficiency technologies are omitted in the *Energy efficiency* sectoral guide, although some of them are mentioned in other guides. For example, clean cooking is categorized under the *Health and wellbeing* and *Energy access and power generation* sectoral guides, has impact on *Forest and land use*, but it is not mentioned under *Health and wellbeing* in the cross-references with other sector guides table in the *Energy efficiency* sectoral guide. The guide would benefit from a more exhaustive description of energy-efficient technologies and applications to assist in the proper

categorization of projects, because energy efficiency projects are currently underreported in the GCF portfolio.

- The pathway of “scaling up efficiency in energy-intensive industries” in the *Energy efficiency* guide does not fully consider the context of the energy-intensive industries. In these industries (such as chemicals, cement, and pulp and paper) energy is used in core processes, and substantial reductions in energy intensity can only be achieved with transformative innovation in underlying technologies, the use of cleaner fuels and the recommissioning of ageing assets. Consequently, such approaches can only be implemented over a long period of time and are quite dependent on technological progress.
 - **Approach to energy generation and energy access:** The key performance indicator for generation is GHG reduction compared to the existing energy mix (usually supplied by fossil fuels), and the key performance indicator for clean energy access is the increase in number of beneficiaries. Having both types of intervention in the same results area is logical from a technology standpoint, but performance and results monitoring and reporting will differ from energy generation to energy access.
 - **Indicators and thresholds:** The sectoral guides outline only potential actions but not expected results or indicators. The GCF approach is not based on thresholds of energy generation or energy saving that would have allowed clearer assessment of the overall project impact, including co-benefits.
 - **Regulatory frameworks:** The sectoral guides do not sufficiently encourage applicants to propose projects that ensure long-term CO₂ emissions reduction by instituting regulatory changes. A proper regulatory framework for any sector is key to ensuring impact, sustainability and replicability of investments. For example, concerning energy efficiency in the building sector, actions for improvement are presented and detailed in the *Cities, buildings and urban systems* sectoral guide. One of them is to “promote and mandate energy ratings and new performance standards (appropriate to both cold and tropical climates) to incentivize net zero buildings”. This action would require a properly enforced energy-efficient building code to be in place, which is not specified in the guide.
134. **Energy projects can have impact in both adaptation and mitigation. However, there is no clear understanding of what can be considered as adaptation in energy projects.**
135. Depending on the application, energy sector investments can address some or all climate change mitigation, adaptation or resilience challenges. For example, an energy-efficient project in an industrial facility that reduces energy consumption by installing a highly efficient heating, ventilation and air-conditioning system is a mitigation investment. An energy-efficient project in the same facility that focuses on peak-demand management (e.g. pre-heating/pre-cooling in off-peak hours and using energy storage to heat or cool during peak hours) is a climate resilience investment, as it helps the electric grid/natural gas network better manage peak energy demand.
136. Peak energy supply is typically the most carbon-intensive energy generation in the energy mix of countries. For example, in Zambia, energy projects are categorized only as mitigation by the GCF when energy is also perceived to be an adaptation priority. The private sector often has incentive to classify energy projects as mitigation because they want to access the credits that come with reducing emissions.
137. The GCF sectoral guides or other documents do not identify which activities can be considered as adaptation in the energy sector.

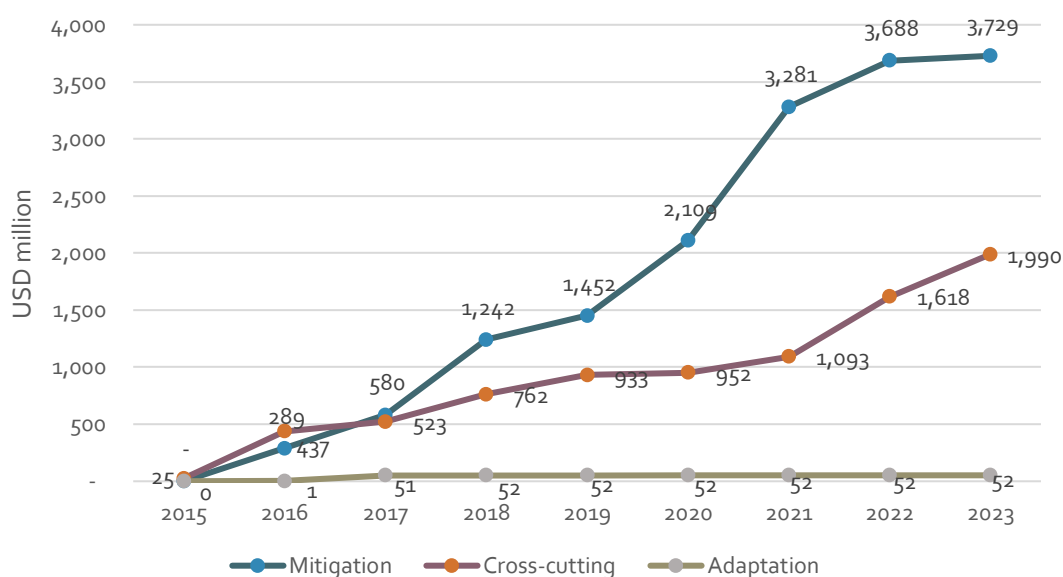
138. The GCF energy sector portfolio includes mitigation, adaptation and cross-cutting projects. Those labelled as adaptation are usually climate resilience projects with a relatively small share related to energy actions, except for one project: FP040, Tajikistan: Scaling Up Hydropower Sector Climate Resilience. The majority of energy projects are either cross-cutting or mitigation (Figure 3–1). It is not completely clear how a project can be considered cross-cutting or only mitigation. In terms of financing, mitigation maintains its upward trajectory compared to adaptation financing (Figure 3–2).

Figure 3–1. Mitigation and adaptation over the GCF portfolio



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

Figure 3–2. Evolution of the energy sector in the GCF themes



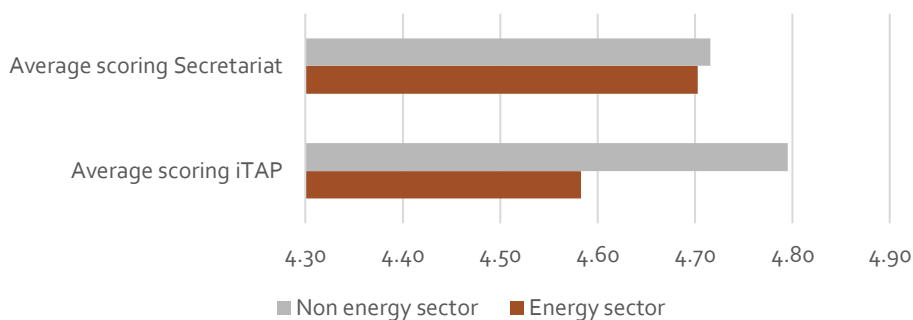
Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

139. The RPSP, proposal approval process (PAP) and SAP modalities offer a wide range of options to project developers. The RPSP is crucial for the development of frameworks to support country programming as well as to provide capacity-building to NDAs and energy sector stakeholders to develop a pipeline of energy sector projects. PAP and SAP projects enable investors and developers to reduce the investment risks of energy projects (see Chapter 7).

C. COUNTRY OWNERSHIP

140. Country ownership has been central to GCF strategy since the beginning, although there is no Board-approved definition of it. Decisions B.07/03, annex VII, and B.08/10, annex XII, established the role of the NDAs / focal points in the initial PAP, including the no-objection procedure. Decision B.08/10, annex XIII, provides initial best-practice guidelines for selecting and establishing NDAs / focal points. Decision B.08/11, annex XVII, provides initial general guidelines for country programmes to enable country ownership through NDA / focal point leadership in the process. Decision B.10/10 reconfirms the importance of enhancing country ownership, country drivenness and the role that NDAs / focal points can play in this regard. Decision B.11/10 further elaborates the role of the NDAs / focal points to lead an annual participatory review of the GCF portfolio in their countries with the participation of all relevant stakeholders. The *Guidelines for Enhanced Country Ownership and Country Drivenness*, adopted at B.17, confirm that the principle of country ownership is fundamental to all GCF operational modalities and policies, with NDAs / focal points to play key roles in building national and institutional capacities and facilitating engagement with relevant stakeholders in the countries.
141. Country ownership is a GCF investment criterion, calling for alignment with NDCs and relevant national plans, and engagement with stakeholders, including NDAs. The Secretariat and the iTAP assess all FPs against this criterion, and Figure 3–3 shows the rating achieved on average. The FPs that contain energy-related activities were assessed as medium-high (4.0) or high (5.0).

Figure 3–3. Average iTAP and Secretariat ratings for country ownership criteria



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

142. **NDA involvement is a key driver to ensure the alignment of GCF projects and country strategies regarding energy transition. GCF project alignment with country priorities may be challenging in multi-country projects.**
143. The country case studies found that all GCF energy-related activities in the studied countries are in alignment with the country's NDC and national plans and the GCF's country programming. It was also observed that the NDAs of some countries have used the RPSP to strengthen their national

capacity to implement energy-related projects as well as to create the enabling environment to attract energy investment. In these countries, the NDA / focal point had the convening power within the government to provide leadership on energy-related climate investment. NDA involvement is a key driver to ensure the alignment of GCF projects and country strategies regarding energy transition. When the NDA is not properly informed by the AEs due to the lack of a formalized process whereby AEs share their investment plans with the NDAs, a lack of alignment between country preferences and GCF investments may appear, as was the case in some country case studies.

144. GCF project alignment with country priorities may be challenging in multi-country projects. Although such projects may be a necessary way to engage new, smaller-scale country partners, care must be taken that multi-country projects respond to particular country needs and priorities, or that activities addressing these needs and priorities are added to the extent feasible. In the case of FP177, Cooling Facility, the evidence shows that the alignment is not complete. The IEU's past evaluations indicate that engagement with relevant stakeholders in countries is not uniformly understood and/or implemented by the AEs and NDAs, in particular for multi-country projects.
145. The contextual knowledge held by national and subnational institutions make them key actors for stronger country ownership, which could be facilitated through their more direct access to finance (Brown and Alayza, 2021). To date, energy-related activities implemented by DAEs are very limited (see Chapter 2 and Chapter 5 for more details).

Chapter 4. EFFECTIVENESS

KEY FINDINGS

- While the GCF partners with a much wider range of AEs compared to other funds, the complexity of the accreditation process limits the number of national DAEs that access the Fund. Those few DAEs available for programming face challenges given the complexity of GCF FP review and appraisal processes and the eligibility limitations in terms of size of projects and risk category.
- Although the overall share of DAEs increased over the GCF-1 period, the approved project portfolio in the energy sector portfolio remains largely skewed towards IAEs.
- GCF business model, and thus the effectiveness of GCF programming, is limited to the existing group of AEs. In particular, alternatives to institutional accreditation, such as the project-specific accreditation approach (PSAA), provide hope to country partners and public and private entities. The objectives of the PSAA remain unclear.
- Commercial-type private sector DAEs are underrepresented. The NDAs have not engaged with the private sector easily and lack flexibility to engage comprehensively with entities in the local, national and regional energy sectors at pre-accreditation and project origination.
- The lack of convening of broader, comprehensive groups of stakeholders through the support of the NDA and focal point led to challenges in the project development cycle, in particular the matching of implementing entities.
- While the GCF-funded activities aim to capitalize on existing initiatives, thanks to AEs, the NDAs' convening power to engage and mobilize energy sector stakeholders, including relevant line ministries, often seems to be low and inconsistent. The value add of NDAs is often considered diminished.
- Initial monitoring evidence shows that, in the energy sector project portfolio, country ownership is often driven by the AEs. Stakeholder engagement at both the national and subnational levels is evolving through innovative practices, capacity-building and knowledge-sharing, led by AEs.
- While the GCF puts stronger emphasis on the monitoring of project-specific enabling conditions and environments from a policy and framework perspective, GCF support programmes, such as the RPSP and PPF, put less emphasis on enabling environments. RPSP grants do provide much needed support in strategic frameworks but there is the opportunity to provide greater support.
- Co-benefits identified in GCF energy sector projects include improvements in water access and sanitation, infrastructure resilience, and crops and food security.
- Socioeconomic benefits such as green jobs creation, improved health or education conditions are not part of the co-benefits tracked by the GCF system.
- GCF energy projects have paid increasing attention to mainstreaming gender and Indigenous Peoples since the 2019 approval of policies and action plans in those areas.
- While the GCF Gender Policy has increased attention to, and the performance of, gender mainstreaming in GCF operations, it still remains a challenge to implement on the ground.
- While the efforts on gender equality in the energy portfolio are increasingly in line with the intent of the Gender Policy and its Gender Action Plan, they are only partly addressing women's involvement in the whole energy value chain. Nevertheless, some promising early results arising from the Gender Policy could be observed.

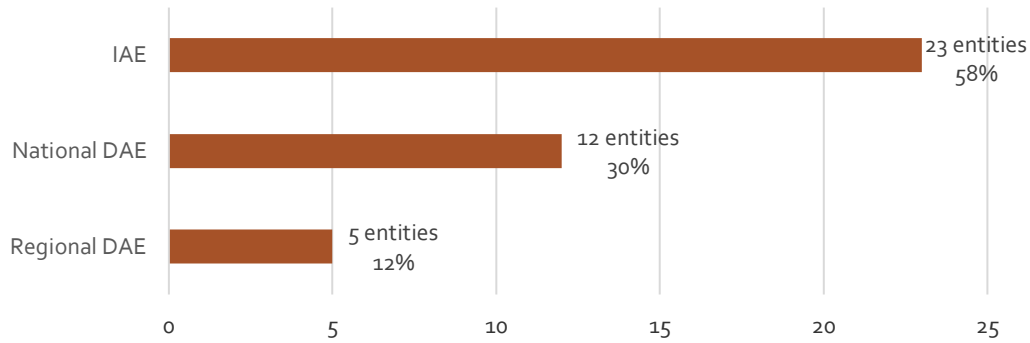
- It is estimated that around 50 per cent of energy projects include an Indigenous Peoples plan and that 37 per cent of all GCF projects can have a direct impact on Indigenous Peoples.
- The GCF is in the early stages of contributing to the deployment of renewable energy generation in developing countries. It has supported some efforts in transmission and distribution but has limited exposure in institutional capacity-building or “emerging” energy sources.
- Energy storage is required to match power generation and energy demand. To date, while the GCF has supported storage for off-grid systems for energy access, it lacks investment in large-scale on-grid storage solutions.
- Energy transmission and distribution are key to the integration of renewable energy national electricity grids, but GCF support in this area remains limited.
- Available information suggests that to date the GCF has not placed significant priority on supporting new – or perhaps better referred to as “emerging” – energy sources.
- The IRMF and the Investment Framework broadly align but do not completely overlap, which means there is a difference between how the GCF makes investment decisions and measures results. The establishment of sectoral guides does not provide further alignment across these frameworks.

A. ACCESS TO THE GCF

146. The GCF's Governing Instrument stipulates that "access to the Fund resources will be through national, regional and implementing entities accredited by the Fund" and that "recipient countries will determine the mode of access and (...) modality". As previous IEU evaluations have underscored, the accreditation model is a fundamental component of the GCF business model, and the Fund and its effectiveness rely profoundly on the network of AEs to deliver the GCF's mandate and implementation in the countries it is serving. Since 2014, the Board has decided on a three-step accreditation process, based on best-practice of ESS, gender consideration and policy, and ensure good financial management in place. Based on a "fit-for-purpose" principle, the application of these policies and standards (fiduciary standards, ESS and gender) supports the categorizing and matching of level of complexity, risks and size of projects to be implemented by AEs. According to decision B.07/02, the GCF Board envisaged an accreditation as a dynamic process, one that is reliable, flexible and credible and links to the readiness and needs of the country to ensure effectiveness in the operations of the GCF.
147. **While the GCF partners with a much wider range of AEs compared to other funds, the complexity of the accreditation process limits the number of national DAEs that access the Fund. Those few DAEs available for programming face challenges given the complexity of GCF FP review and appraisal processes and eligibility limitations in terms of size of projects and risk category.**
148. With a paucity of DAEs, countries often face challenges in accessing the GCF to address their urgent needs in the national and local energy sector context. The GCF follows a very different approach compared other larger climate funds, such as the CIF and the GEF. These two funds work exclusively with six MDBs and 18 global, regional and national financial institutions or organizations, respectively. Similar to the Adaptation Fund, the GCF works with a variety of AEs. Currently, the GCF is accessed by a large array of 95 AEs²² from the public and private sectors, including global, regional, national, sub-national and non-governmental financial institutions and organizations. During the project/programme cycle, project ideas and concept notes are to be shared with the GCF by AEs, country partners or through RFP processes, and these concepts are later converted into action. While the GCF's AE network is constantly expanding, re-accreditation concerns and the ineffectiveness of RFPs raise questions about access to the GCF, in particular when discussing project ideas in the energy sector. As found in past IEU evaluations, the lack of an accreditation strategy became apparent in the GCF's first two programming periods (the IRM and GCF-1) and continues to create stress points within the GCF partnership.
149. **Although the overall share of DAEs increased during the GCF-1 period, the approved project portfolio in the energy sector portfolio remains largely skewed towards IAEs.**
150. Based on the entire GCF project portfolio to date, only 58 of the 95 AEs are currently managing and implementing GCF projects. When looking at the GCF energy sector project portfolio, only 40 AEs are managing and implementing GCF-funded projects with one or more energy components. Of those 40 AEs, 23 are IAEs (Figure 4-1).

²² Accreditation process completed.

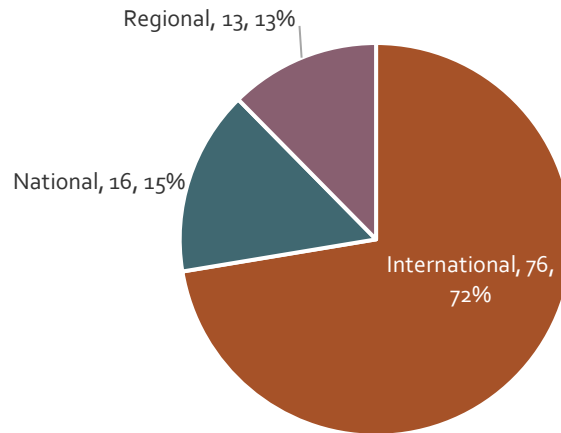
Figure 4–1. Count of entities implementing an energy project by AE type



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

151. In all, 72 per cent of energy sector projects have been developed by IAEs, compared to only 13 per cent by regional DAEs and 15 per cent by national DAEs. In contrast, these AE types respectively represent 37 per cent, 11 per cent and 52 per cent of all AEs. Furthermore, DAEs are often more limited in terms of the size of projects and the risk category that they can be approved for, and thus need to rely on IAEs to access GCF funds for larger and riskier projects. Financial share is also dominated by the IAEs (Figure 4–3).
152. On the other hand, the question of sufficient coverage must also consider the willingness and capacity of IAEs and regional DAEs to take on projects in their relevant geographies. For example, while regional and national DAEs are often the preferred AEs for SIDS, they are often overwhelmed with requests for both RPSP and pipeline development relative to their staff capacity. Some regional DAEs work with up to 14 GCF-eligible SIDS yet have fewer than five staff members, which is considered a serious limitation to undertake relatively complex energy sector FPs and projects. Similarly, staff from many IAEs report being disincentivized from pursuing the smaller-sized projects often associated with SIDS and LDCs by what they perceive as high transaction costs when working with the GCF. This is especially felt by SIDS and LDCs, where there are urgent needs for increasing energy access (LDCs) and for switching to renewable energy generation (SIDS); however, there are no national and regional DAEs accredited in the size of project and risk category for vulnerable countries. As a result, these countries often need to work with IAEs to get access to GCF funds, as the project portfolio analysis clearly shows in Figure 4–2 below.

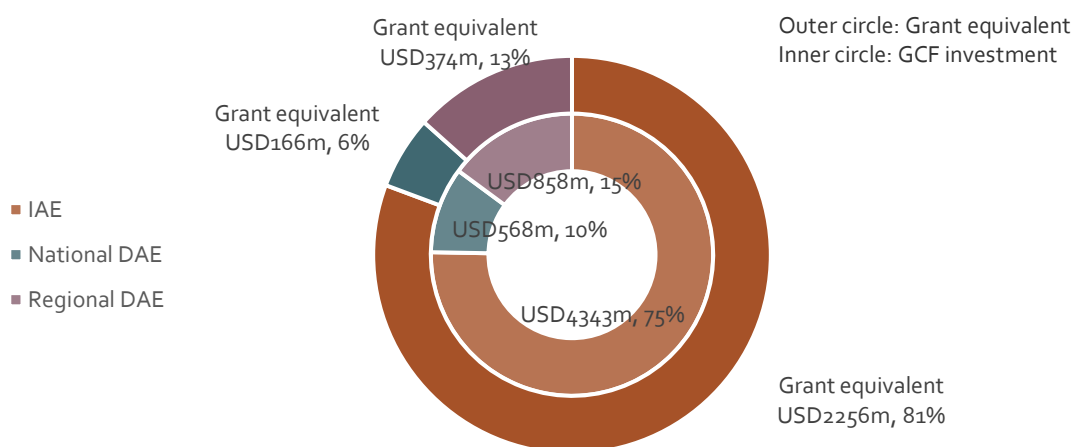
Figure 4–2. Distribution of energy projects by AE type (entire GCF portfolio)



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

153. The evaluation team also reviewed the PSAA in addition to institutional accreditation. A PSAA has been under consideration for three years; however, its main objectives remain unclear. In principle, the PSAA would broaden access to the GCF for entities and countries seeking GCF resources on an ad hoc and limited basis but for whom the associated costs of institutional accreditation are too high. It is intended as a complementary mechanism that would also enable the GCF to target specific projects and programmes.
154. **Interviewees stated that the GCF business model, and thus the effectiveness of GCF programming, is limited to the existing group of AEs. In particular, alternatives to institutional accreditation, such as the PSAA, provide hope to country partners and public and private entities; however, FPs developed under the PSAA have to be considered by the Board. The objectives of the PSAA remain unclear.**
155. While this limitation of the business model, and thus the effectiveness of GCF programming, may be true for all sectors served by the GCF, it becomes particularly relevant to the energy sector, because this sector is considered to be fast, innovative and paradigm-shifting. Interviewees from both the public and private sectors conveyed having high expectations around the PSAA. Similarly, the Secretariat is burdened with processing increasing pipelines for accreditation and re-accreditation. In principle, the PSAA would broaden access to the GCF for entities and countries seeking GCF resources on an ad hoc and limited basis but for whom the transaction costs of institutional accreditation are too high. This is particularly interesting for smaller entities who are interested in programming in the national and local energy sector. It is intended as a complementary mechanism that also would enable the GCF to target specific projects and programmes. However, in line with the findings of the IEU's accreditation synthesis and private sector evaluation, this evaluation also concludes that the objectives and strategic purpose of the PSAA remain unclear, especially in terms of attracting more and different private sector entities.
156. Measures taken by the Secretariat since 2020 to define clearer roles and responsibilities for partners and to move away from a "one-size-fits-all" partnership model, including providing alternatives to institutional accreditation, may be generally expected to address some concerns raised by interviewees in relation to energy sector projects but will require validation once under implementation. At this point, the evaluation team could further assess the utility of a PSAA approach.

Figure 4–3. Distribution of GCF investments in the energy sector by AE type



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

B. PRIVATE SECTOR ENGAGEMENT

157. **Based on the analysis of the energy sector portfolio to date, commercial-type private sector DAEs are underrepresented. The NDAs have not engaged with the private sector easily, and they lack flexibility to engage comprehensively with entities in the local, national and regional energy sectors at pre-accreditation and project origination.** To date, 24 DAEs that have self-identified as private sector entities are working on GCF-funded energy projects under the PSF. Of these, nearly 60 per cent are financial institutions, banks or investment funds. The majority of GCF investments for energy access and generation and cross-subsectoral energy projects are handled by 16 IAEs. Only three regional DAEs are managing and implementing GCF-funded projects in the subsector of energy efficiency.
158. Table 4–1 below shows the DAEs that currently manage GCF-funded projects with an energy component. DAEs occupy 28 per cent of the total energy portfolio. Africa and Asia-Pacific each have 10 approved projects, while LAC has nine projects. Interestingly, all energy projects in Asia-Pacific region are from national DAEs, and most of projects in the LAC are from regional DAEs. The distribution of energy projects is slightly higher for the national DAEs. Most of them are, however, national development banks and international financial institutions. The evaluation team observed that energy subsectors supporting innovative and new approaches to the energy markets present a large opportunity for the GCF and its current portfolio, including green hydrogen as well as large-scale on-grid solutions and storage.

Table 4–1. Current DAEs in the energy portfolio by GCF region

TYPE OF DAEs	NAME OF DAE	AFRICA	ASIA-PACIFIC	LATIN AMERICA AND THE CARIBBEAN	APPROVED PROJECTS
National	AEPC		1		1
	DOE_ATG			1	1
	EIF	1			1
	FDB		1		1
	IDCOL		1		1
	JSBank		1		1
	KDB		1		1
	MOE_Rwanda	2			1
	MoFEC	1			1
	NABARD			1	1
	Profonanpe				1
	XacBank			4	4
	National	4	10	2	16
Regional	BOAD	4			4
	CABEI			1	1
	CAF			4	4
	CCCCC			2	2
	DBSA	2			2
	Regional	6		7	13
	Grand total	10	10	9	29

159. The capacity of NDAs and focal points to effectively engage with the private sector remains weak. In line with previous IEU evaluations, this evaluation found that there is little guidance on the role of the private sector in country programming and consultation, resulting in poorly informed private sector stakeholders possibly working independently from national policy goals in energy. The private sector engagement that does occur seems to be driven mostly by proactive private sector stakeholders who resort to alternative avenues to the GCF, instead of contacting the NDA and focal point directly. Interviewees confirm that the information provided through the GCF website is often preferred to an initial conversation with the NDA. When both the interested entities and the NDA confirm their interest, entities, in particular private sector entities, describe the requirements and process to access the GCF as challenging. This includes both the accreditation and review process and the appraisal process for concept notes and FPs.
160. In energy sector context in particular, national actors and private sector networks are not convened or fully utilized for comprehensive stakeholder consultations and to strengthen the country ownership of the potential future investments with the GCF. The role of the NDA as a convener and provider of oversight of private sector projects has been very limited. The case studies undertaken by this evaluation indicated that NDAs and focal points have conducted limited mapping of stakeholders in the energy sector and thus limited consultation with the private sector entities on

potential future investments and support for a comprehensive enabling environment for GCF investment. In particular, the NDAs have held limited to no consultation on policy and regulatory reforms, technical capacity-building, and readiness of the countries' local energy sector.

161. **The lack of convening of broader, comprehensive groups of stakeholders through the support of the NDA and focal point led to challenges in the project development cycle, in particular the matching of implementing entities.**
162. A key challenge observed by private sector DAEs relates to finding and matching suitable and available executing entities for proposed GCF FPs. Also, collaborating and investing with state-owned power companies is particularly challenging due to political interference, lack of autonomy, or low credibility, which can lead to a bad credit rating preventing private sector investment as well as deployment of loans in the energy sector.
163. While the RPSP support could be augmented, the evaluation team observed that there have been efforts at engaging the private sector through structured knowledge management and sharing tools, supported by readiness grants. Some interviewees opined that the RPSP has identified the limitation of NDAs and focal points to engage meaningfully with the private sector in some country contexts. In some instances, the GCF's RPSP had been implemented to generally support the engagement with the private sector on climate issues, where otherwise nothing had been done.

C. COUNTRY ENGAGEMENT

164. **While GCF-funded activities aim to capitalize on existing initiatives, thanks to AEs, the NDA's convening power to engage and mobilize energy sector stakeholders, including relevant line ministries, often seems to be low and inconsistent. The value add of NDAs is often considered diminished.**
165. The GCF business model is rooted in partnerships and dependent on NDAs, AEs, delivery partners and other key climate partners to support paradigm shift in low-emission and climate-resilient development pathways. While direct access is an essential tool to support country ownership in the GCF, channelling funding through DAEs is not the only way to ensure a country-owned pipeline of GCF projects. The evaluation found that while GCF-funded activities in the energy sector aim to capitalize on existing sectoral initiatives, coalitions and platforms during the planning process, which remains critical to creating multiplier effects at scale and promoting joint learning and knowledge transfer, the focal points and NDAs in country play a central and catalytic role in the GCF business model.
166. NDAs and focal points are usually working under the auspices of a Ministry of Finance, Environment, Economy or Planning. This institutional arrangement often poses coordination challenges with the Ministry of Energy due to a lack of institutional authority, technical expertise and alignment of planning processes between ministries. Energy regulatory bodies are also independent, with ministries having limited control over them. Some stakeholders noted that this might hamper efficient support and synergies in origination and implementation of energy sector projects.
167. Country case studies converge on the evidence that NDAs engage with a large group of public sector stakeholders in the energy sector. However, in some countries, such as Chile, partnerships with regulatory bodies such as the National Energy Commission are still not fully developed. For the private sector, there is high interest in engagement with the GCF, but more needs to be done to ignite collaborations by tapping into private sector organizations and networks. National

stakeholders also noted organizations that can assume a consultative role in project implementation, are often not represented adequately. For example, in Zambia, organizations such as the Energy Regulatory Board and Association of Power Companies Zambia were not aware of GCF-funded activities in the country. Also, it is important to note that energy regulatory bodies operate independently, with limited oversight from ministries. In several country contexts, interviewees considered that strengthening the NDAs' capacity to engage with the private sector at national level could support transformational and paradigm shift events. If provided with a stronger knowledge of both financial instruments and the role of the private sector in the transition, NDAs can be pivotal in supporting country ownership.

168. National stakeholders also note the importance of network collaboration to facilitate GCF initiatives and ultimately support a coherent and cohesive approach to the energy sector at the country level. For example, international development organizations in Tonga hold regular coordination meetings (usually led by the International Bank for Reconstruction and Development (IBRD)) at which the GCF is not represented. While the NDA is expected to take the lead in such coordination, the growth of climate finance flowing into Tonga is outpacing the capacity of the government to develop, approve and implement climate projects.
169. Regular regional events that facilitate sharing experiences among countries are also considered very important but are currently lacking in most country contexts. North Macedonia stakeholders perceived such regional conferences as necessary and hosted one in October 2023. These events are not specifically related to the energy sector; however, they can increase the awareness of stakeholders of the region about climate change actions, including the energy sector.
170. **Initial monitoring evidence shows that, in the energy sector project portfolio, country ownership is often driven by the AEs. Stakeholder engagement at both national and subnational levels is evolving through innovative practices, capacity-building and knowledge-sharing, led by AEs.**
171. The synthesis of 26 APRs found concerning but yet promising results on stakeholder engagement. Key activities initiated and supported by AEs include knowledge exchange, collaboration with government and NGOs, and initiatives for education, capacity-building and training on different issues relevant to the climate projects. Other engagements are geared towards establishing public–private partnerships. In some instances, the AE has become the point of contact to discuss activities, functions, roles and responsibilities that would originally be attributed to the role of the NDA and GCF focal point of a country. While the overall effectiveness of the implementation of GCF-funded projects is unaffected, the roles and responsibilities of the NDAs and GCF focal points in the countries are variable. For most country stakeholders, this has become a concern for future project origination, effective RPSP support and country programming.
172. Some GCF-funded projects report on intentional and active inclusion of female stakeholders, enhancing participation and knowledge exchange in decision-making. Project teams under the leadership of the AEs reported on key activity undertaken with national key stakeholders, civil society organizations and community leaders in collaboration with the NDA. FP028, in Mongolia, notes collaboration involving the NDA, Ministry of Environment and Tourism, NGOs and public sector organizations on green financing options, and support to the Parliament of Mongolia on the Energy Conservation Law. FP062, in Paraguay, formed alliances with existing national initiatives, including the Sustainable Finance Roundtable and the Public–Private Partnership for Sustainable Finance, to enhance the competitiveness of financial products and to motivate other financial institutions to launch green financing products.

173. FP081, in India, focuses on education of stakeholders, including policymakers and regulators. Meanwhile FP073, in Rwanda, provides training for smallholder farmers, enhancing adaptive capacities and scalability. During the reporting period, opportunities for public–private partnerships to support national climate priorities and commitments to ongoing collaboration were identified. FP017, in Chile, adopts interdisciplinary approaches, offering technical capacity-building for municipal stakeholders. For a closer collaboration with community members, FP115, also in Chile, funds a community connectivity centre with computer and internet access, which a community manager visits weekly to answer residents' questions.
174. Subnational actors are expected to be involved in consultations and participate as implementers. In Zambia, under the technical assistance component of FP080, there is an activity dedicated to stakeholder consultations for rural electrification sites. Subnational stakeholders, including traditional leaders, will be involved to ensure that the project is inclusive. In Chile, FP017 gives the municipality of Pica an active role in project implementation to identify suitable candidates for training, maximize local employment opportunities, and obtain a positive response from local enterprises prior to the construction phase. In Mongolia, the executing entities for some projects are at subnational levels (e.g. FP077 – Municipality of Ulaanbaatar).
175. The role and responsibilities of the NDA even blur increasingly as the project cycle advances. As further explained later in this report, AEs do not provide regular monitoring updates on project progress to the NDAs and focal points. NDA representatives argued that GCF policies and frameworks are at times not understood or even known. The *Monitoring and Accountability Framework for Accredited Entities*, adopted through decision B.11/10, defines the responsibilities of AEs in relation to their institutional and project-by-project relationship with the GCF. Monitoring and accountability involve a series of actors with specific roles and responsibilities. These include AEs, the Secretariat and the GCF accountability units, NDAs or focal points, the direct beneficiaries of the projects and programmes, project-affected people and communities, and other local actors such as local governments, civil society organizations, non-governmental organizations and the private sector. The Framework states, “The NDA or focal point is encouraged to organize an annual participatory review for local stakeholders, notably project-affected people and communities, including women and civil society organizations” (Green Climate Fund, 2015). In most country case studies, such reviews with local stakeholders were not held consistently throughout the implementation of GCF-funded projects and programmes.

D. ENABLING ENVIRONMENT OF THE ENERGY SECTOR

176. Another critical factor for effectiveness in climate programming for the energy sector is the enabling environment in which such projects and programmes will be implemented. Only with the approval of the IRMF (as per decision B.29/01) has the GCF begun to put stronger emphasis on considering and monitoring factors for an enabling environment. The IRMF supports the Fund and AEs in tracking how projects and programmes are contributing to climate adaptation and mitigation outcomes, while also considering the enabling conditions and environment that can promote paradigm shift (Table 4–2).

Table 4–2. Core indicators for enabling environment, as defined by the IRMF Results Handbook, April 2022²³

ENABLING ENVIRONMENT INDICATORS		RATIONALE FOR SELECTING
Core indicator 5	Degree to which GCF projects/programmes contribute to strengthening institutional and regulatory frameworks for low-emission climate-resilient development pathways in a country-driven manner.	A core strategy of the project is to support the strengthening institutional capacity across recently established government agencies.
Core indicator 6	Degree to which GCF projects/programmes contribute to technology deployment, dissemination, development or transfer and innovation.	The project's main focus is the introduction of new technology (green transport), using new fuel sources (biogas from cattle), into a new context.
Core indicator 7	Degree to which GCF projects/programmes contribute to market development / transformation at the sectoral, local or national level.	Central to the project's sustainability strategy is the building of demand for greener technology from transport operators and customers (transit users) alike. The project will also build new markets for private sector operators (including contracts for public transport).
Core indicator 8	Degree to which GCF projects/programmes contribute to effective knowledge generation and learning processes, and use of good practices, methodologies and standards.	The proposal notes that the project is untested but – if found to be viable – could be replicated across the country and beyond. In order to support this replication, the project will be generating learning and knowledge products to raise awareness of the solution being tested.

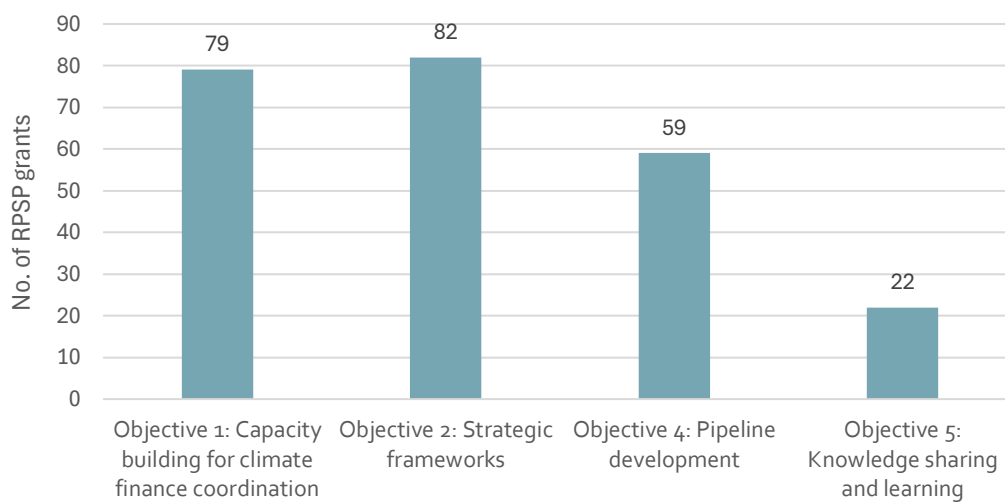
Source: Green Climate Fund (2022b).

177. **While the GCF puts stronger emphasis on the monitoring of project-specific enabling conditions and environments from a policy and framework perspective, GCF support programmes, such as the RPSP and PPF, have the opportunity to provide greater support for an enabling environment in the local context, at the country and regional levels in the energy sector.**
178. This support is, however, underutilized. The IRMF Results Handbook explains that the enabling environment indicators require both qualitative baselines and targets, and an optional quantitative, scorecard-derived baseline, to potentially support the qualitative analysis at a later stage. As with the approach for paradigm shift, AEs should develop a qualitative baseline for each of their selected enabling environment indicators: (i) for institutional and regulatory frameworks; (ii) technology deployment, development and transfer; (iii) market development and transformation at sectoral or local level; and finally, (iv) effective knowledge generation and learning. This narrative baseline should describe the current context within which the project/programme will be working. Qualitative targets should also be developed, hypothesizing the change to the enabling environment that the project/programme will support. However, this is the only working definition of “enabling environment” within the Fund.
179. The RPSP support only partially refers to enabling environments and remains far vaguer about its definition. The strategic objectives of the RPSP refer to an enabling environment primarily in

²³ Available at <https://www.greenclimate.fund/sites/default/files/document/draft-results-handbook-v11-01092023.pdf>.

Objective 2.2, Support strategic framework development. The *Readiness and Preparatory Support Programme Guidebook* refers to examples such as undertaking the necessary studies, modelling, and other research to enhance strategic frameworks, improve sectoral expertise, and enhance enabling environments for GCF programming in low-emission climate-resilient investment (Green Climate Fund, 2023c). These may include risk and vulnerability assessment, databases, climate change scenario modelling, impact modelling, assessments or research studies. It also refers to creating enabling environments for mobilizing climate finance and the private sector. In practice, since 2015, the GCF RPSP has issued 709 readiness grants, for a total value of approximately USD 530 million with the majority of readiness grants in capacity-building for coordination and strategic frameworks.

Figure 4–4. RPSP support on enabling environment for energy sector



Source: iPMS and Fluxx data (15 July 2023), analysed by the IEU DataLab.

180. When a country does consider an RPSP grant and support related to the energy sector, most grants link directly to the support of strategic frameworks (Figure 4–4). As of 2023,²⁴ the 95 RPSP grants have activities that address four out of five RPSP objectives. Most – 82 in total – are aligned with Objective 2, on strategic frameworks, which is closely followed by Objective 1, on capacity-building, with 79 grants. Objective 4, on pipeline development, is represented in 59 projects, whereas only 22 grants cover Objective 5, on knowledge-sharing and learning. As these numbers show, most grants are directed towards objectives related to strategic planning and capacity-building, which cover the wider consideration of enabling environments of the energy sector.
181. While the support to strategic frameworks is positive development, the needs for the energy sector readiness support might need to be higher than currently is. Countries tend to consider other urgent needs first, potentially in other sectors. This disincentive may increase the likelihood of less-effective implementation of energy projects, or even sustainability concerns for the longevity of energy sector projects. In at least one country case study, the evaluation team found evidence of a lack of consideration of enablers – for example, regulatory frameworks, energy grid tariffs, institutional frameworks – which ultimately led to the ineffective project implementation.
182. Throughout the country case studies, it was observed that when a GCF RPSP grant provides support to the energy sector, it provides great support for creating enabling environments in the country

²⁴ As of June 2023, of the 95 RPSP for the energy sector, 7 per cent have been completed and another 80 per cent have been disbursed, with around 13 per cent still in legal processing.

regarding energy investment in the context of climate change. Enabling environment principles include strong, transparent legal and regulatory frameworks, especially to align policy frameworks between the country, regional and subregional levels; strong regulatory institutions; creditworthy off-takers in the energy sector; cost-reflective retail tariff structures; technical and commercial efficiency in the local energy sector; procurement processes; strategic and integrated energy sector planning. However, our RPSP portfolio review found that the RPSP is not yet fully utilized to assist capacity-building for the energy sector; remedying this will help ensure more coherent and systematic institutional support at the country level. RPSP results table is in the Volume II of this report.

183. A review of the energy-related FPs and IRMF revealed that while the monitoring of enabling environment indicators is provided for through the IRMF and its associated handbook, the GCF does not have a systematic approach to promoting the creation of an enabling environments during the project development and appraisal process. This in turn limits the incentive for projects to focus on establishing an enabling environment for energy sector projects. To date, the GCF does not have a tool to value project activities that enable regulatory changes. This could also constrain stakeholders' capacity to undertake sector reforms that would support a paradigm shift. Other frameworks do not speak directly to enablers and/or enabling environments. (please see Chapter 6 for more detailed discussion about this in comparison with the other climate funds and MDBs).

1. CO-BENEFITS

184. **Co-benefits identified in GCF energy sector projects include improvements in water access and sanitation, infrastructure resilience, and crops and food security.**
185. Co-benefits describe GCF financing that supports climate action while also furthering development objectives and are a useful concept in helping to articulate how climate and development are interconnected. They are social and economic opportunities that arise as result of adopting more sustainable and climate-resilient energy technologies and measures such as improved public health, accelerating access to electricity, improved investment opportunities resulting from plummeting costs for renewable electricity, gender equality and social inclusion.
186. Co-benefits are identified in each GCF project. Out of 99 energy projects, 76 contribute to improved access to renewable and/or efficient energy, which should not be considered as a co-benefit as it is a direct result of the energy projects; 31 projects contribute to water access and sanitation; and 31 to improved infrastructure resilience (see Figure 4–5).

Figure 4–5. Share of projects contributing to co-benefits and type of co-benefits



Source: Tableau server iPMS data, as of B.36 (15 July 2023), analysed by the IEU DataLab.

187. **Socioeconomic benefits such as green jobs creation, improved health or education conditions are not part of the co-benefits tracked by the GCF system.**
188. Socioeconomic benefits such as green jobs creation and improved health or education conditions, incomes and livelihood are not part of the co-benefits tracked by the GCF system, although they do occur. For example, energy efficiency projects in buildings have numerous co-benefits in improving the well-being of building occupants. FP194 (PEEB) brings about greater comfort for occupants, leading to increased productivity in education and commercial buildings; environmental benefits related to better sorting and disposal of construction waste, reduction of light and noise pollution; health co-benefits through improved ventilation, less indoor air pollution and temperature stress; and economic benefits linked to the reduction of utilities bills, including water. Such socioeconomic benefits are often as important for beneficiaries as the energy-related improvements.
189. There are challenges in understanding the potential co-benefits for the final beneficiaries of energy projects, and the lack of information limits the assessment of the unintended results of GCF investment in energy.
190. Co-benefits are assigned to each of the energy projects based on project content and are tracked. The number of project beneficiaries is usually collected in an aggregated manner, not with the co-benefits disaggregated by sex and/or by socioeconomic characteristics. This does not permit

assessment of the degree of co-benefit for vulnerable groups such as women and Indigenous Peoples.

191. The evaluation team has not identified any unintended positive or negative results at the portfolio level, mainly due to the early implementation stage of the majority of GCF energy sector projects. For a few completed projects, some positive unintended results have been identified. For example, some countries' NDAs reported that interacting with the GCF has also substantially improved the overall quality of their energy ministry's governance.

2. GENDER AND INDIGENEOUS PEOPLES

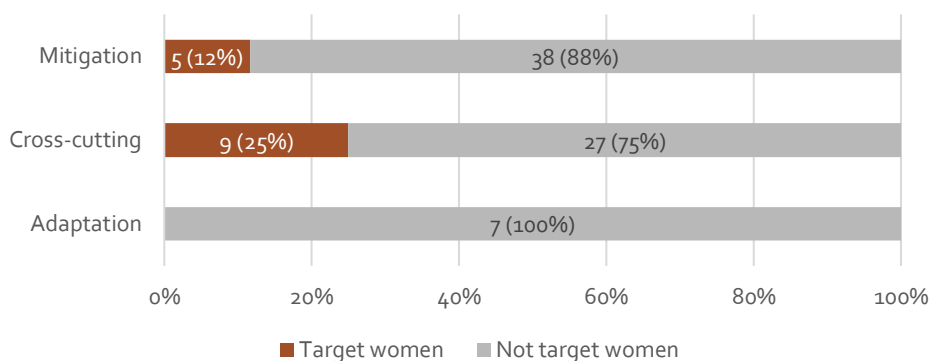
192. **GCF energy projects have paid increasing attention to mainstreaming gender and Indigenous Peoples since the 2019 approval of policies and action plans in those areas.**

193. The second performance review of the GCF found that the Fund has been steadily and systematically positioning itself to better address gender equality and social inclusion, including of Indigenous Peoples. The overall GCF portfolio has shown improvement in mainstreaming gender since the endorsement of the new Gender Policy and Indigenous Peoples Policy in 2019, with 80 per cent of ongoing projects having gender action plans.

194. This positive trend could not, however, be confirmed for the energy portfolio, where only 26 per cent of projects mentioned women's and vulnerable groups' needs. This can be attributed to the fact that most energy projects were approved before the Gender Policy and its Action Plan were adopted, when gender mainstreaming in GCF projects was not compulsory. According to portfolio analysis, out of all energy projects financed by the GCF, 81 were approved before or during 2019; the year the current Gender Policy was adopted. A further 18 projects were accepted for funding after 2019 (10 are mitigation projects, 8 cross-cutting, and none adaptation).

195. As shown in Figure 4–6, only five mitigation projects, amounting to USD 1 million, and nine cross-cutting projects, amounting to USD 6.3 million, targeted women.

Figure 4–6. Project count and share of total number of GCF energy investments that especially target women



Source: Tableau server iPMS data, as of B.36 (15 July 2023), analysed by the IEU DataLab.

196. **While the GCF Gender Policy has increased the attention paid to, and the performance of, gender mainstreaming in GCF operations, it still remains a challenge to implement on the ground.**

197. Gender assessments in the sampled energy sector projects tended to consider a broader level than the scope of the project, assessing gender at the sector and country levels, rather than specifically in the area and topic of the intervention. In design, project gender objectives and activities did not necessarily align with the findings and recommendations of the gender assessments, because the issues identified in the latter were out of the project scope as, in turn, were the activities and targets of the gender action plans. Gender action plans then tended to be overly ambitious as they set broad, general objectives that tried to tackle issues beyond the scope and capacity of the project.
198. The level of completion of energy project gender action plans, and their achievement of results, was mixed. For example, a project in Tonga set targets to engage several women in project implementation. This could not be achieved because in general the skilled labour-force is limited in Tonga, especially females educated in energy-related disciplines, a trend that had been highlighted in the gender assessment. But it was also observed that even when the activities proposed in the gender action plans were relevant to the context, they were not always fully implemented, and many outputs not achieved. About half of the projects reviewed were falling short of the targets set in their gender action plans. The reasons related to lack of context sensitivity, of capacity in dealing with gender and Indigenous Peoples' issues, and limited awareness on the part of AEs.
199. Monitoring and reporting of gender action plans takes place at the project level through a results framework that is outlined separately from the main energy project results frameworks. The vertical logic of gender results frameworks was therefore not clearly aligned with that of the overall project results frameworks. Outputs and outcomes of project gender action plans are not aggregated to sector or corporate level, which makes it difficult to assess the overall performance of gender mainstreaming in the energy sector.
200. **While the efforts on gender equality in the energy portfolio are increasingly in line with the intent of the Gender Policy and its Gender Action Plan, they are only partly addressing women's involvement in the whole energy value chain. Nevertheless, some promising early results arising from the Gender Policy could be observed.**
201. The majority of energy project activities involved women's engagement in implementation, along with targets for jobs created for women. The portfolio analysis shows that 49 per cent of the energy projects mention job creation for women and 36 per cent mention engagement of women as labour-force for the implementation of the project. There were also quotas to ensure minimum participation of women in capacity development activities (training), awareness-raising and consultation processes. The energy portfolio analysis shows that 35 per cent of projects mentioned engaging with women's stakeholder groups; 40 per cent involving them in training and 10 per cent in awareness-raising. Little attention is paid though to the participation of women in other parts of the energy value chain – access to energy and success as entrepreneurs (e.g. to deliver related services). No project was identified in the reviewed sample that had addressing gender equality and Indigenous Peoples' issues in the energy sector as the main or a specific objective.
202. Sex disaggregated results data are collected at project level using the action plan matrix. This includes specific activities, outputs, baselines and targets, which in theory should facilitate tracking of gender equality performance in the project. However, the quality of reporting on the results of the gender action plans is mixed. While some projects have been adequately monitored as per their gender action plan matrix, others do not include information on progress towards the targets set. One final evaluation of a project reported that despite implementation challenges overall performance was satisfactory.
203. In Zambia, for example, the gender action plan contributed to enhanced gender policies in the AEs, and created jobs for women or improved women's access to energy tools that clearly had an impact

on women's lives. In Tonga, at least 33 per cent of the electricity management committees were made up of women. In Mongolia, almost half of the project staff were women, including women engineers, some of whom came from vulnerable economic and social circumstances. Another energy project in Mongolia, on supporting Mongolian enterprises to embrace energy efficiency and renewable energy, distributed 98.6 per cent of the GCF funding, or 80 per cent of the total disbursed amount, to women-led enterprises. Capacity-building targets for the reporting year were surpassed, of which just over 60 per cent of clients were women. And in Chile, besides creating job opportunities for women, gender mainstreaming through the 143 MW solar park Tarapacá Region supported AEs to adopt policies to increase gender equality and safety in the workplace (e.g. non-discriminatory and anti-harassment policies). This project also included the possibility of providing funding to women-led enterprises, following a similar approach implemented in Mongolia, but this is still to be implemented.

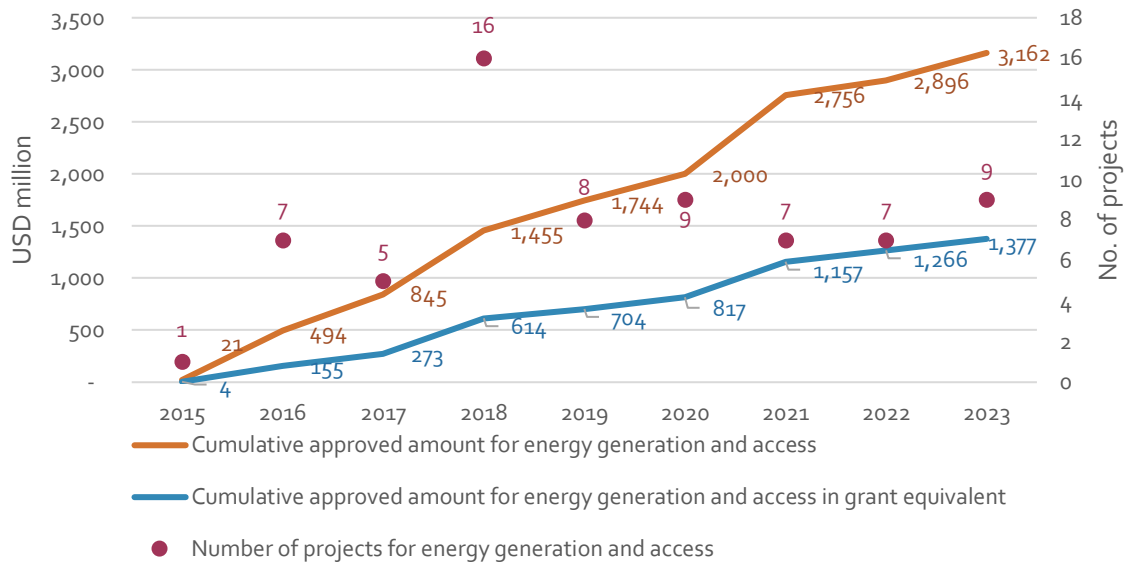
204. A qualitative review of 26 APRs specifically targeting energy generation and access reflected progress in supporting gender equality beyond employment in the project. The Global Subnational Climate Fund (known as SnCF Global) showed that improved energy services for girls and women enabled them to replace traditional responsibilities of collecting fuel and water with educational and income-generating activities. The project reported that 100 per cent of its sub-projects had engagement plans for the participation of women. The low-carbon water management scheme and increasing water availability for sustainable agriculture in Gaza recognized women as the “invisible partners in development” and developed a gender-sensitive communication strategy that acknowledges their contribution to the agricultural value chain.
205. The implementation of the Indigenous Peoples Policy requires that AEs deliver a series of documents outlining potential issues that might affect Indigenous populations and how these will be addressed at project level. This should include baseline information as part of the environmental and social risk and impact assessment process. Key considerations include risks and opportunities, measures to be taken (tenure arrangements, community-based natural resource management, grievance redress mechanisms, etc.), consultation lists, budget, roles and responsibilities, and a monitoring and reporting system. Proposal documents are reviewed by the GCF as part of the approval process and recommendations provided so that the required Indigenous Peoples Policy provisions are met.
206. **It is estimated that around 50 per cent of energy projects include an Indigenous Peoples plan and that 37 per cent of all GCF projects can have a direct impact on Indigenous Peoples.**
207. The review of 26 APRs of energy-related projects shows some progress in involving Indigenous and ethnic groups in GCF energy projects. A project in Paraguay linking poverty, forestation and energy is expected to benefit the entire Indigenous community in the targeted forestry area, rather than solely project participants. The Tina Hydropower project in Solomon Islands engaged different Indigenous Peoples communities living in the area.
208. At the same time, according to independent evaluations of energy projects, Indigenous and Afro-descendants' leaders were largely dissatisfied with their level of inclusion as project beneficiaries, and integrating gender equality in these contexts can be more challenging due to sociocultural sensitivities.
209. The existing IRMF is not ready to collect and report gender and identity disaggregated data, which is one of the main challenges to assessing the impact of the Gender Policy and Indigenous Peoples Policy.

3. GCF PROGRAMMING IN ENERGY SUBSECTORS

210. **The GCF is in the early stages of contributing to the deployment of renewable energy generation in developing countries. It has supported some efforts in transmission and distribution but has limited exposure in institutional capacity-building or “emerging” energy sources.**
211. The GCF has contributed, and is continuing to contribute, to the deployment of renewable energy generation, as shown in Figure 4–7 below. In its energy project portfolio, 57 projects are classified under the “Energy access and power generation” sectoral guide and 69 projects are classified under the *Energy generation and access* results area. Because the GCF classification mixes energy access and power generation, the calculation of GCF support to the energy generation sub-sector is imprecise.
212. The GCF supports energy generation projects using different technologies adapted to the local context:
- **Solar PV:** The PV technology is the most widely supported by the GCF, with 43 appearances in the portfolio.²⁵ This now has a very low technology risk. However, there will continue to be project risk for the party that carries cost, revenue collection and storm damage risk.
 - **Onshore wind:** The GCF has supported eight projects that include wind-related technology, three of which are onshore. The technology risk is quite low, but project development risk exists due to the cost of carrying out long-term reliable resource assessment measurement campaigns prior to investing in infrastructure.
 - **Offshore wind:** The GCF supported three projects using offshore wind technology. This type of project carries significantly higher risk due to logistics and the cost of offshore installation and delivery of power to shore.
 - **Hydropower:** The GCF has financed 16 projects that implement hydropower technologies.
 - **Solar thermal:** This technology is often considered as energy efficiency because it is installed at small scale in buildings or neighbourhoods. The GCF financed at least one project with solar thermal collectors for domestic hot water. The technology risk is low when the use of the hot water is for low to medium temperatures (up to 60°C). Solar thermal plants producing steam or high-temperature water for industrial processes, or to produce electricity, are riskier and require large capital investment.

²⁵ Using the label taxonomy of the GCF.

Figure 4–7. Evolution of GCF energy generation investments: energy generation and access

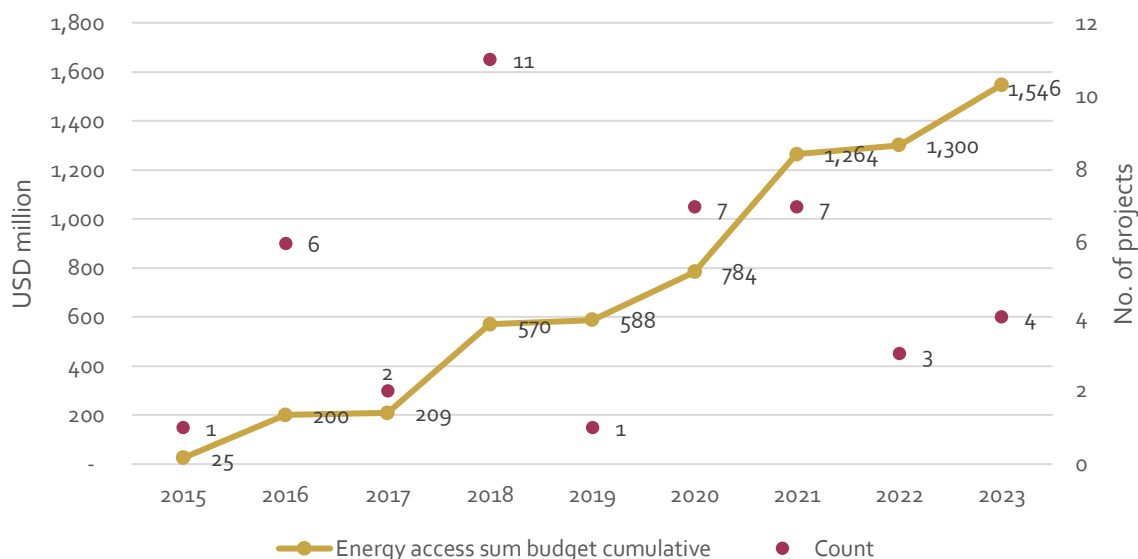


Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

213. The GCF’s guidance and classification system does not clearly separate energy generation and energy access, which makes it difficult to isolate and assess the effectiveness of energy access projects. A thorough analysis of the energy sector portfolio was conducted to identify energy access focused projects, as shown in Figure 4–8. Thirty-two projects in Africa and Asia, totalling USD 1.5 billion,²⁶ promoted access to modern renewable energy, based on the GCF taxonomy.
214. The GCF supported energy access projects for beneficiaries to access reliable and high-quality equipment in Africa, where the main challenge lies. Their expected outcomes address the following important barriers:
- Inadequate enabling policy and regulatory frameworks (FP163)
 - Misaligned costs, reliability, quality and affordability (FP070, FP103 and FP172 (clean cooking) as well as FP080, FP027, FP168, FP148, FP163 and SAP013)
 - Insufficient and misdirected energy access financing (FP070, FP103 and FP172 (clean cooking) as well as FP080, FP027, FP168, FP148, FP163, SAP013)

²⁶ Considering that the projects under the “Promoting Access to Modern Renewable Energy” taxonomy are entirely supporting energy access activities and removing some projects that were not tagged properly (FP221, SAP 004, FP197, FP177, FP164, FP156, FP150, FP140, FP063, FP044).

Figure 4–8. Evolution of GCF energy access investments



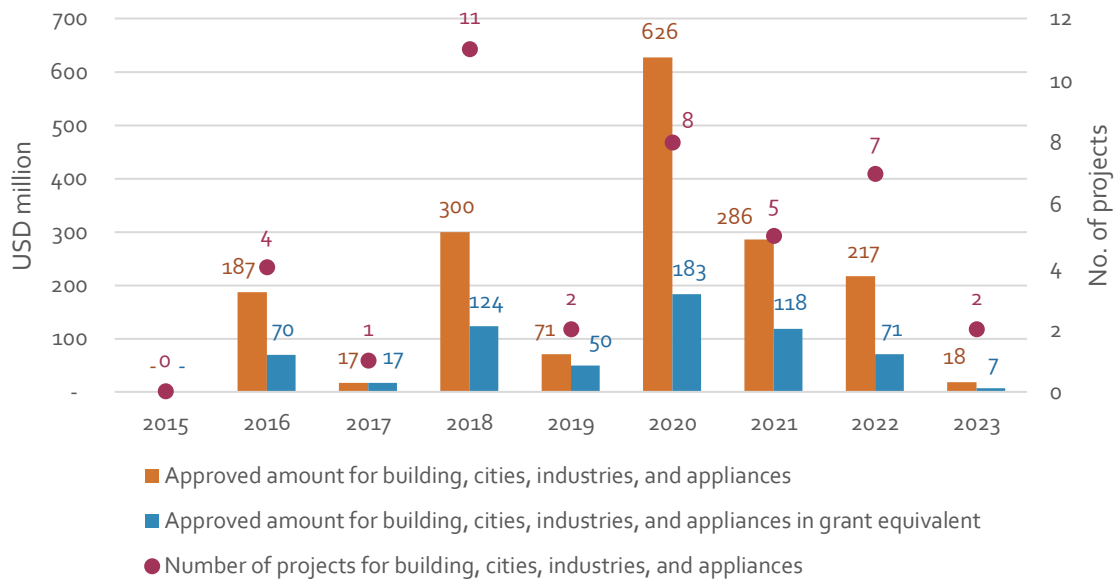
Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

215. **Energy storage is required to match power generation and energy demand. To date, while the GCF has supported storage for off-grid systems for energy access, it lacks investment in large-scale on-grid storage solutions.**
216. The GCF has supported the institutional capacity-building that countries need to adapt existing power systems, as demonstrated by FP033, FP036, FP090, FP096, FP102, FP138, FP163 and SAP016, which are mainly related to energy access for efficient productive use, and some of which incorporate battery storage to balance power supply. The mini-grids supplied by renewable energy require storage to be able to operate continuously, so batteries are installed in the electricity supply systems. There is scope for the GCF to achieve greater paradigm shift through both the scaleup and replicability of these funded activities.
217. While GCF support is demand driven, it is important to note that there have been no utility-scale storage solutions, apart from hydropower, which can be used as a storage system. Other technologies to store energy are available that do not require scarce materials such as lithium-ion, including flywheels, gravity storage and electrochemical storage with hydrogen. Utility-scale storage will, however, require adapted regulatory frameworks, which could be supported by the GCF.
218. **Energy transmission and distribution are key to the integration of renewable energy national electricity grids, but GCF support in this area remains limited.**
219. The GCF supported some actions in the transmission and distribution subsector. Using the GCF taxonomy, 45 projects include actions related to grids and 38 projects mention transmission in their interventions. The energy projects database includes 93 projects tagged with efficient and reliable energy transmission, distribution and storage. GCF energy generation projects generally include the transmission lines necessary to connect the renewable energy power plant to the main network. Energy access projects include mini-grid solutions to supply the intended beneficiaries. However, the energy projects portfolio does not include large-scale upgrades to existing transmission and distribution networks.

220. **Available information suggests that to date the GCF has not placed significant priority on supporting new – or perhaps better referred to as “emerging” – energy sources.**
221. Until B.37, the energy sector portfolio of the GCF did not include projects supporting hydrogen technologies to produce electricity or to be used as storage, or the production of clean hydrogen to replace fossil fuels in heavy industries, since clean hydrogen was still an emerging technology.²⁷ The newly approved project FP224, Renewable Barbados Project, concerns an investment in hydrogen storage supplied by a solar power plant. The GCF supported two projects exploring geothermal energy potential (FP020 and FP083). GCF support to bioenergy has been limited due to lack of clear guidance to AEs. To date, few bioenergy projects focus on biomass and biogas technology applications related to adaptation or clean cooking. Two projects (FP190 and FP195) mention funding of tidal technology.
222. Clearly there is an opportunity for the GCF to step in and fill gaps in helping emerging energy sources become major contributors. Funding of studies to support the development of national policies, institutional capabilities and regulatory procedures could set the stage for demonstration projects, after which private sector investors might be more willing to make the large investments needed for production at scale.
223. **The IRMF and the IF broadly align but do not completely overlap, which means there is a difference between how the GCF makes investment decisions and measures results. The establishment of sectoral guides does not provide further alignment across these frameworks.** For instance, the results area of “Buildings, cities, industries, and appliances”, which includes mainly energy efficiency projects, accounts for 30 per cent of GCF energy sector support, showing an underfinancing of this subsector compared to its decarbonization potential. Currently the GCF portfolio includes 31 projects under the *Energy efficiency* sectoral guide. Except for three projects, all are combined with elements from other guides: *Energy generation and access* (15 projects) and *Cities, buildings and urban systems* (26 projects). In some cases, the categorization is not fully appropriate. For example, FP194, Programme for Energy Efficiency in Buildings (PEEB), is not considered under the sectoral guide *Cities, buildings and urban systems*.
224. The GCF considers efficient productive energy use across all sectors, so additional effort was made to look for energy efficiency projects in the GCF. Under the GCF taxonomy, 40 projects are classified under “decarbonization of urban energy systems”, 10 under “space energy efficiency” and 19 under “industrial energy efficiency”.
225. Figure 4–9 shows a 2020 spike in GCF investment in energy efficiency under the results area of “Buildings, cities, industries, and appliances”, thanks mainly to two projects: FP150, Promoting private sector investment through large-scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh, and FP140, High Impact Programme for the Corporate Sector (multi region).

²⁷ Only FP189, E-Mobility Program for Sustainable Cities in Latin America and the Caribbean, mentions green hydrogen.

Figure 4–9. Evolution of energy efficiency projects in the GCF (under results area “Building, cities, industries, and appliances”)



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

226. The results area “Buildings, cities and industries & appliances”, which includes mainly energy efficiency projects, accounts for 30 per cent of GCF energy sector support, showing an underfinancing of this subsector compared to its decarbonization potential and its transversality across sectors (in comparison, the “Energy generation and access” results area accounts for 60 per cent). All sectors of the economy should first reduce their energy consumption through energy-efficient measures before envisaging consuming or investing in renewable energy.

4. CHALLENGES IN PROJECT IMPLEMENTATION

227. The synthesis of APRs from 2019 to 2022 identified the following key challenges in the implementation of the energy sector projects:

- Design flaws, often due to insufficient site assessment and logistics planning
- Financial challenges, mainly caused by inflation and occasionally by COVID-19 measures or currency risks/conflicts
- Implementation hurdles arising from unexpected factors during project execution
- Procurement issues consistently linked to flows in procurement plans, material shortages or global price surges and national procurement rules and regulations
- Technical problems, which surged notably in the 2021–2022 updates, especially among national DAEs

228. Other challenges pertain to capacity, most of the time referring to the limited capacity of public stakeholders or changes in governmental offices due to elections or internal conflicts. Such changes mentioned typically resulted in delayed onboarding or postponed continuation of implementation activities, with frequent mention of delayed signing of agreements or lower ownership than originally anticipated. There was also very frequent mention of the lack of timeliness by public stakeholders to carry out necessary processes in which case, AEs provided capacity-building or ensured frequent communications with the relevant offices.

229. Among national DAEs, challenges related to procurement ranked between capacity and design flaw, extreme weather, implementation challenges, politics, policy and ESS. However, for overall APRs as well as among IAEs, the second highest challenge was capacity, followed by design flaw, financial, implementation, politics/policy, and procurement. For challenges relating to politics and policy, except for those related to internal national conflicts, the challenges were typically related to capacity in that either project ownership was lacking, or exact roles and responsibilities were not clearly defined prior to implementation.

Chapter 5. EFFICIENCY

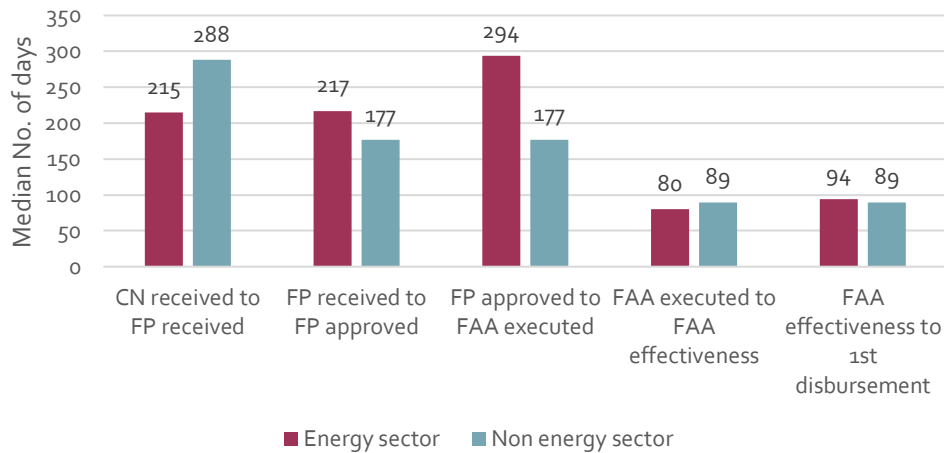
KEY FINDINGS

- The SAP modality suggests a simplified process for project approval. The GCF energy project portfolio shows no significant difference in the speed of project origination, review and approval between the SAP and the PAP. As a result, AEs are largely disregarding the SAP modality for energy projects, with only seven approved SAP proposals to date.
- The project origination cycle is lengthy and comprises the concept note review, FP review and approval. The project life cycle is considered costly by most of the AEs interviewed, and for energy sector projects it takes, on average, 2.5 years from concept to first disbursement. Internal processes are key drivers for the lengthy cycle. In the GCF's energy portfolio, there is no significant difference in the speed of FP approvals between projects processed under the DMA and those under the PSF.
- GCF energy project origination is country driven, supported by NDAs and AEs. Most projects in the energy portfolio show that project origination was predominantly driven by AEs with strong local and regional engagement. Efficiency concerns are largely linked to the engagement with NDAs, focal points and the GCF Secretariat, and are driven by a lack of clarity around the positioning of the Fund and its priorities.
- Overall, the evaluation found that there has been limited use of the RPSP and the Project Preparation Facility (PPF) for pipeline development of energy projects. Stakeholders noted that the relevance of the support programmes (or lack thereof) is linked to inefficient processes and the positioning of the NDA / focal point. Additional costs with the application and review process of the GCF's PPF outweigh the benefits of the PPF for project preparation.
- MDBs and climate funds use carbon pricing to assess the cost-effectiveness of investments in the energy sector. The range for carbon prices recommended by the High-Level Commission on Carbon Prices is USD 50–100/tCO_{2e} by 2030. The cost-effectiveness assessment of the GCF energy sector portfolio shows a range between USD 43.98 and USD 68.89 per tCO_{2e}, which is slightly lower than the Commission's recommended range.
- Energy efficiency projects are the most cost-effective project type, at USD 34.3/tCO_{2e}, followed by buildings and urban systems (USD 47.8/tCO_{2e}), energy access and power generation (USD 62.0/tCO_{2e}), and low-emission transport (USD 74.6/tCO_{2e}) projects.

A. PROGRAMMING MODALITY

230. **The SAP modality suggests a simplified process for project approval. The GCF energy project portfolio shows no significant difference in the speed of project origination, review and approval between the SAP and the PAP. As a result, AEs are largely disregarding the SAP modality for energy projects, with only seven approved SAP proposals to date.**
231. Following the *GCF Programming Manual* the project review and approval cycle shows, in theory, very small differences between the SAP and regular PAP. The submission of concept notes is optional for the SAP, whereas they are mandatory for the PAP. Prior to Board consideration, the GCF Secretariat and the iTAP review the proposal and annexes, following identical process. Our analysis shows that while the review and appraisal of SAP proposals takes approximately 149 days in theory, it takes 214 days on average, which is not substantively faster than the time frame for regular FPs (190 days). This evaluation confirmed the findings of the IEU SAP evaluation (2020) that most of the seven SAP projects with a strong energy component support further testing and demonstration of ideas or approaches but do not support scaling up initiatives themselves. Some interviewees confirm these results and opine that the SAP has not been preferred for scaling innovative approaches by the GCF ecosystem, due to limitations in speed and predictability. The SAP modality does not show a differentiated approach to programming, compared to the regular project approval process.
232. **The project origination cycle is lengthy and comprises the concept note review, FP review and project approval. Across the entire energy project portfolio, the GCF takes on average 2.5 years from concept to first disbursement of funds to activities. Internal processes are key drivers for the lengthy cycle. There is no significant difference in the speed of FP approvals between projects processed under the DMA and those under the PSF.**
233. Our data analysis shows that the GCF takes, on average, more than 926 days to process an energy sector project, from the concept note to the first disbursement (see Figure 5–1). Some review and approval processes, especially those where the AE is an IAE and MDB, show shorter processing times across all stages. In these instances, the review and approval processes take approximately one year from concept note to loan approval. The reasons for this are manifold and context specific. Some interviewees and case studies indicate that, in particular, the lack of human resources and sectoral staff at the GCF Secretariat as well as the high staff turnover are considered hinderances to the smooth processing of energy sector projects to date.
234. The top hindrances in project origination identified are as follows:
- Reviewers / focal points provide unclear, repetitive comments
 - The high turnover of reviewers / focal points
 - The lack of clear guidance on technologies and GCF requirements
 - The lack of predictability regarding the success of a concept note
 - The lack of coordination between GCF divisions
 - The lack of predictability regarding the success of a concept note

Figure 5–1. Time taken to progress energy and non-energy projects across the different project stages, in days (2015–2023) including SAP



Source: Tableau server iPMS data, as of B.36 (15 July 2023), analysed by the IEU DataLab.

Note: CN = concept note

235. To take a closer look at the different project stages, there are, on average, no significant deviations between the final two stages of the project appraisal process (FAA effectiveness and first disbursement) across the portfolio of energy sector projects and non-energy projects. At a portfolio level, stronger deviations are observed for the concept note review, FP approval process and FAA execution. The processing time for the review of concept notes is significantly lower for energy projects compared to the rest of the portfolio, over time. It should be noted here that the submission of concept notes is optional for the SAP, and the energy project portfolio generally shows a lower number of SAP projects compared to the rest of the portfolio. Importantly, the PAP takes significantly longer for energy sector projects, compared to the rest of the portfolio, and even overshoots standard processing time, at 190 days, as per the benchmark described in the Programming Manual. This is concerning in terms of not only speed but also the predictability of processes. This finding further supports the perception of the non-predictability of GCF processes by the GCF ecosystem.
236. There is no significant difference in the speed of the FP review and approval process between public and private sector projects in the GCF's energy portfolio. The review and approval period for energy FPs processed under the DMA and the PSF takes 216 and 211 days, respectively. The review of energy project concept notes under the PSF tends to be slower, on average, compared to those under the DMA.
237. While projects under the DMA and the PSF undergo an identical review process at the GCF, in the initial concept note stage the processing of projects supported by the PSF takes slightly longer (256 days) than those of the DMA (223 days). However, the overall processing times align when the subsequent FP approval stage is considered. Overall, the data analysis shows that the processing of energy sector projects seems to be more efficient under the PSF compared the energy projects of the DMA and non-energy projects once the FP is approved. Finally, in the disbursement stage, energy projects under the PSF seem to take longer compared to all other groups. Interviewees and document review underscore that this relates to the complex financial analyses and risk assessments, customization of support to suit private sector needs, and more extensive engagement and coordination in private sector energy projects.

238. The long processing times observed by private sector entities currently engaged in GCF projects are a key concern and at times a potential deterrent for future engagement with the GCF. Interviewees argued that the lack of clear criteria and reasons for why a proposal is approved or not, and the uncertainty of approval at all, discourages IAEs from even presenting proposals. Private sector entities, especially, struggle to adequately estimate the cost for the level of preparation and perceive the review process as unpredictable. They struggle to anticipate or plan for the different stages and the timelines, making it difficult for them to engage with the GCF, as also highlighted in previous evaluations.
239. The flexibility and streamlining of review and approval processes (the co-creation process) is especially relevant for private sector financiers. Investments in the private sector have stricter timelines than public sector investments, and thus investors expect prompt decisions from the GCF. An example is FP115 – *Espejo de Tarapacá* – a project incorporating a pumped storage hydroelectric plant and a solar power plant in Chile. The project staff held discussions with several potential strategic investors during 2021. The project company's board of directors approved the non-binding term sheet with *Électricité de France*, and the term sheet was presented to the GCF together with a restructuring proposal in August 2021. The review process for this proposed restructuring extended over eight months, culminating in a GCF team notification in March 2022 that this represented a significant change to the project, necessitating more procedures for approval. Consequently, the company formally requested the GCF to terminate the contract.
240. The project appraisal and approval process cycle for GCF energy projects is perceived as bureaucratic, lengthy, inconsistent and often a duplication of effort, especially for IAEs who are working with multiple actors and other climate funds.
241. IAEs have their own stringent internal procedures, due diligence and timelines for project appraisal and approval. These include technical assessment, economic analysis, gender assessment, environmental and social considerations, and risk assessment. Co-financed projects are submitted to their boards for approval and then to the GCF for its own due diligence process, following strict format and content requirements. Interviewees report that some of these requirements may be similar but not identical to the ones used by the submitting agencies or other multilateral climate funds (e.g. the CIF or GEF). In particular, interviewed MDB representatives find these steps to be a duplication of due diligence, which translates into ineffective coordination and inefficient project appraisal and approval processes overall.
242. Furthermore, all interviewed MDB IAEs confirmed that their timelines for allocating similar amounts of funding take less time (approximately a year from a concept note to a loan approval), comparatively. Also, the costs associated with project preparation are considered to be lower than those for the GCF. The evaluation confirmed this when reviewing a sample of specific energy sector projects funded by AEs and other agencies in the energy sector. Given IAEs experience and the current perception of GCF processes, the Fund is usually seen as a potential funding option after all other alternatives have been exhausted. Upon reviewing other climate funds, the evaluation found that the time spent to access GEF funds is difficult to compare, since MDB IAEs' processes are distinct from those of the GCF. These processes may also involve different actors.

B. PROJECT ORIGATION AND COUNTRY PROGRAMMING

243. **GCF energy project origination is country driven, supported by NDAs and AEs. Most projects in the energy portfolio show that project origination was predominantly driven by AEs with strong local and regional engagement. Efficiency concerns are largely linked to the**

engagement with the NDAs, focal points and the GCF Secretariat, and are driven by lack of clarity around the positioning of the Fund and its priorities.

244. Unlike most other development organizations (such as EBRD), which relate financial support to economic or sectoral reforms, the GCF has climate change as its only mandate. The GCF's investments are driven by the NDAs and AEs, providing blended finance to a wide range of public and private partners with differing priorities (renewable energy and energy efficiency focused, social or development impact investors, etc.). This opportunity to invest through a blended finance modality generally aligns investments well with countries' priorities and the GCF's market transformation mandate.
245. At the country level, the evaluation found that, across the energy sector portfolio, the GCF has partnered and negotiated with key international and national stakeholders in the energy sector. An initial review of the interim evaluations found that a subset of GCF-funded energy activities was coherent with national priorities and the countries' commitment to energy reform. According to most IAEs, the principle of country ownership has trade-offs that translate into efficiency losses across the entire project origination cycle. In particular, MDBs and MDB local networks are not used effectively and efficiently in GCF processes. MDBs are usually locally embedded across different ministries (e.g. ministries of energy, industry, economy and others relevant to an energy sector approach at the national level), national development banks and commercial banks, private sector actors and civil society and non-governmental organizations. The GCF model largely relies on one focal point and NDA. Thus, the level of efficiency of GCF processes at the country level are largely dependent on efficient and effective partnerships between the NDA / focal point and the other actors. While coherence is observed as a result of strategically linking GCF energy initiatives to country programming, further efficiency gains would largely be dependent on the integration of a specific energy sector approach in the planning processes. The evaluation observed a variety of success factors to support efficiency gains – these being, among others, stakeholder consultation efforts, integration of feedback and contributions, and building trust with local networks and actors as early as the planning stages of country programming.
246. The evaluation identified the following key aspects that led to deficiencies in sector-specific programming with countries:
 - The relative distance between the GCF and NDA – in particular, communicating across different time zones (little daytime interaction with GCF staff) and the lack of local or regional presence – has been identified as a key hinderance for seamless communications and a common, shared understanding and the ability of the GCF to originate energy sector projects directly with NDAs and other stakeholders.
 - Most interviewees shared a perception that there is a lack of human resources, high staff turnover, and lack of sectoral staff (i.e. staff dedicated to the energy sector) at the GCF Secretariat. According to interviewees, this has delayed and limited the coordination process with country partners and thus the origination of quality energy sector projects.
 - Direct engagement with the IAEs in the process of project origination (particularly for energy efficiency) could improve the engagement of local stakeholders early in the process. In particular, the MDB representatives interviewed noted that their active engagement with NDAs at the country level and the GCF correlates with the effective and efficient development and implementation of energy sector projects.
 - In the origination process, tools are available to guide AEs in the formulation of concept notes and FPs. Between September 2021 and December 2022, the GCF released 10 sectoral guides.

Their structure and especially the cross-referencing to other guides have evolved over time. However, the guides are not prescriptive in nature and lack clarity on direction and clarity on the current preferences of the GCF energy sector portfolio.

- Efficient and effective project origination is challenged by the lack of clarity on GCF investment priorities. AEs' feedback to questions at the concept note stage and at the FP stage is not properly captured. The predictability of the approval of concept notes is limited. The FP review process remains largely opaque for entities and country partners, with no option to receive a clear rejection of a proposal. Such a process creates inefficiencies as the AE may revise concept notes and FPs indefinitely. During the approval review process, AEs also noted contradictory and repetitive comments and frequent changes in reviewers and focal points.
247. Despite the potential concessionality advantage, there are cases where this may be attenuated due to blending requirements, which can increase the overall cost to the end borrower. This was observed in private sector projects in Mongolia.
248. Private sector actors perceive the transaction costs of pursuing GCF projects to be high and approvals to be uncertain. For private sector projects the transaction costs of working with the GCF are perceived to be higher than working with any other international financial institution. DAEs have to contend with high operational costs, including human resources. The scale of these costs varies depending on the project's size²⁸ and the country in which the project is implemented.
249. Case study interviews indicated that especially in Africa and SIDS, private sector DAEs have struggled to engage with the GCF project preparation process as well as to engage with an IAE willing to develop a concept note and FP with them. For example, in Tonga, for smaller size projects, private sector entities cannot offset the transaction costs related to the length and unpredictability of the origination process. Similarly, in Zambia, DAEs find GCF project design is costly, with low bankability. Pursuing GCF projects is seen as a high-risk effort, very stringent, unpredictable, resource-intensive, and with no guarantee of a positive outcome.

C. SUPPORT MODALITIES

250. **Overall, the evaluation found that there has been limited use of the RPSP and the PPF for pipeline development of energy projects. Stakeholders noted that the relevance of the support programmes (or lack thereof) is linked to inefficient processes and positioning of the NDA / focal point.** RPSP grants are mostly directed towards strategic planning and capacity-building, and only a few funded pipeline development and knowledge-sharing with identified links to the national and regional energy sector and related contexts.
251. The disbursement rate of RPSP grants with energy sector elements is at 80 per cent, with 7 per cent of RPSP grants completed. The 95 RPSP grants identified as relevant to the energy sector include activities that address four out of five RPSP objectives. Most – 82 in total – are aligned with Objective 2, on strategic frameworks, which is closely followed by Objective 1, on capacity-building, with 79 grants. Objective 4, on pipeline development, is represented in 59 projects, whereas only 22 grants cover Objective 5, on knowledge-sharing and learning. Only 13 per cent of the RPSP grants show relevance to components of the national and regional energy sector. Interviewees also opined that most NDAs are hosted outside the line ministries (mostly at the Ministry of Finance or a ministry responsible for environment and climate change) and therefore

²⁸ When dealing with projects smaller than USD 20 million, transaction costs can be relatively high.

have no further in-depth understanding and knowledge of key enablers for national and regional energy sectors.²⁹

252. **For individual project preparation, the PPF is viewed as slow and costly relative to the alternatives provided by IAEs. The additional costs incurred in the GCF PPF's application and review process outweigh the PPF's benefits for project preparation.** IAEs indicate that the timeline to allocate their own project preparation funds is shorter and costs less than trying to access the PPF. Out of the 75 submitted PPF proposals (of which 25 were approved), four (5 per cent) were submitted by and awarded to IAEs. None of those resulting project proposals were approved by the GCF in the end. The GCF's PPF is perceived as a facility that requires an additional, and thus inefficient, application process, in addition to the already lengthy project development and appraisal process. While more risky and innovative project proposals may require additional assessments and studies, the PPF process is considered inefficient and not able to respond to the needs of AEs and their projects in a timely manner. Additional costs outweigh the benefits of this facility. Interviewed stakeholders indicated that two factors explain this: (i) agencies' internal costs for energy project preparation (human and financial) can be four to five times lower than using the GCF's PPF; and (ii) accessing internal funds and outsourcing the drafting of the GCF project proposal takes a quarter to a third of the time it takes to use the GCF's PPF. The GCF project development cycle lacks the integration of the project preparation and potential financial support for a certain type of project proposal.

D. COST-EFFECTIVENESS OF GCF ENERGY SECTOR PROJECTS

253. In this section, following current approaches in the global energy sector, carbon pricing is used to assess the cost-effectiveness of investments in the energy sector. Several of the MDBs are currently using **shadow carbon pricing**, which informs decision-making when assessing potential transactions. The High-Level Commission on Carbon Prices (HLCCP), a World Bank initiative, recommended carbon prices of at least USD 40–80 per tCO₂e by 2020 and **USD 50–100 per tCO₂e by 2030** to keep global warming below 2°C. This reference is used by several MDBs when evaluating climate mitigation projects, including both energy and non-energy ones. For example, EIB uses a shadow carbon price for cost–benefit analysis for transport projects and cost-effectiveness analysis for projects in all sectors where cost–benefit is done. The World Bank and the International Finance Corporation use the HLCCP shadow carbon price for all investment projects subject to GHG accounting. Shadow carbon pricing can be used in either cost–benefit analysis or cost-effectiveness analysis (World Wide Fund for Nature, 2019). The use of carbon pricing was thus deemed relevant to assess the cost-effectiveness of GCF investments in the energy sector.
254. **The assessment of MDBs' and climate funds' carbon pricing shows an average cost-effectiveness ranging between USD 37/tCO₂e and USD 70/tCO₂e, slightly lower than the recommended range by the HLCCP of USD 50–100 per tCO₂e by 2030.** Several evaluations of the MDBs and climate funds were reviewed to compare their cost-effectiveness with that of the GCF. The evaluation team also put particular emphasis on the proposed carbon pricing recommendations. In the *Evaluation of the Scaling up Renewable Energy Program (SREP)*³⁰ in Low

²⁹ For a comprehensive list, see <https://cdm.unfccc.int/DNA/bak/index.html>. Note that the UNFCCC refers to NDAs as DNAs [designated national authorities].

³⁰ As explained on the Climate Funds Update website, “The SREP was designed to demonstrate the economic, social and environmental viability of low-carbon development pathways in the energy sector in low-income countries. It aims to help

Income Countries (ICF, 2022), a cost-effectiveness benchmark analysis was performed. The SREP reports a portfolio average of USD 37/tCO₂e for GHG reductions. This is broadly in line with the median of the portfolio of non-SREP projects (USD 33/tCO₂e), as presented in Volume II of the report. The median project in the SREP portfolio has a higher abatement cost (USD 118/tCO₂e).

255. According to the thematic evaluation report *ADB Support for Action on Climate Change, 2011–2020* (ADB Independent Evaluation Department, 2021), the Asian Development Bank's (ADB) social cost of carbon is currently USD 36.30/tCO₂e at 2016 prices in real terms, rising at a rate of 2 per cent per year, which equates to USD 43.20/tCO₂e for 2020. According to ADB's *Energy Sector Project Evaluations, 2015–2019* report (2020), the sovereign portfolio of 34 projects had a total approved amount of about USD 5.3 billion and resulted in GHG emissions reductions of 9,720,780 tCO₂e per year. If we consider that energy efficiency measures have, in general, a lifetime of about 10 years, whereas the lifetime of renewable energy measures is at least 20 years, we can calculate a cost-effectiveness of ADB's sovereign portfolio that varies between USD 54.5/tCO₂e and USD 27.3/tCO₂e.
256. According to the *Agence Française de Développement's (AFD) Energy Transition Strategy 2019–2022 Mid-Term Review Summary* (2021), 5 million tons of avoided CO₂ emissions annually resulted from EUR 3.3 billion in investments. This represents a cost-effectiveness varying between EUR 66/tCO₂e and EUR 33/tCO₂e, or approximately USD 70/tCO₂e and USD 35/tCO₂e.
257. **The cost-effectiveness assessment of the GCF energy sector portfolio, conducted by project type, shows a range between USD 43.98 and USD 68.89 per tCO₂e, which is slightly lower than the recommended range of the HLCCP but comparable to that of MDBs and climate funds.**
258. This evaluation has conducted an analysis of the GCF energy project portfolio, first focusing on the GCF financing contribution only (Table 5–1) and then on the total project budget including co-financing (Table 5–2).

Table 5–1. GCF financing contribution cost-effectiveness, energy sector portfolio (USD/tCO₂e)

	ENERGY PROJECT 100% *	ENERGY PROJECT **	MIXED ENERGY	ENERGY EFFICIENCY	ENERGY ACCESS AND GENERATION	MITIGATION	CROSS-CUTTING
Min	0.89	0.54	0.54	1.25	0.76	0.89	0.54
Max	112.81	150.68	119.81	38.61	150.68	112.81	150.68
Median	12.69	9.12	7.31	9.67	9.75	8.17	6.13
Average	21.93	23.38	19.45	15.22	28.62	16.70	20.91
Count	51	96	23	21	52	66	64

Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

Note: * means all components of a project is related to energy, while ** means some components of a project is related to energy.

low-income countries use new economic opportunities to increase energy access through renewable energy use and to foster economic growth.” The SREP is a programme of the Strategic Climate Fund, one of two funds under the CIF. Further details are available at <https://climatefundupdate.org/the-funds/scaling-up-renewable-energy-program-for-low-income-countries/>.

Table 5–2. Total financing (GCF + co-financing) contribution cost-effectiveness, energy sector portfolio (USD/tCO₂e)

	ENERGY PROJECT 100%*	ENERGY PROJECT**	MIXED ENERGY	ENERGY EFFICIENCY	ENERGY ACCESS AND GENERATION	MITIGATION	CROSS-CUTTING
Min	3.65	3.37	4.87	6.54	3.37	2.14	1.17
Max	245.75	284.43	201.30	245.75	284.43	245.75	284.43
Median	44.98	37.41	25.34	54.18	40.05	26.79	19.46
Average	66.53	61.65	43.98	64.57	68.89	50.18	44.18
Count	51	96	23	21	52	66	64

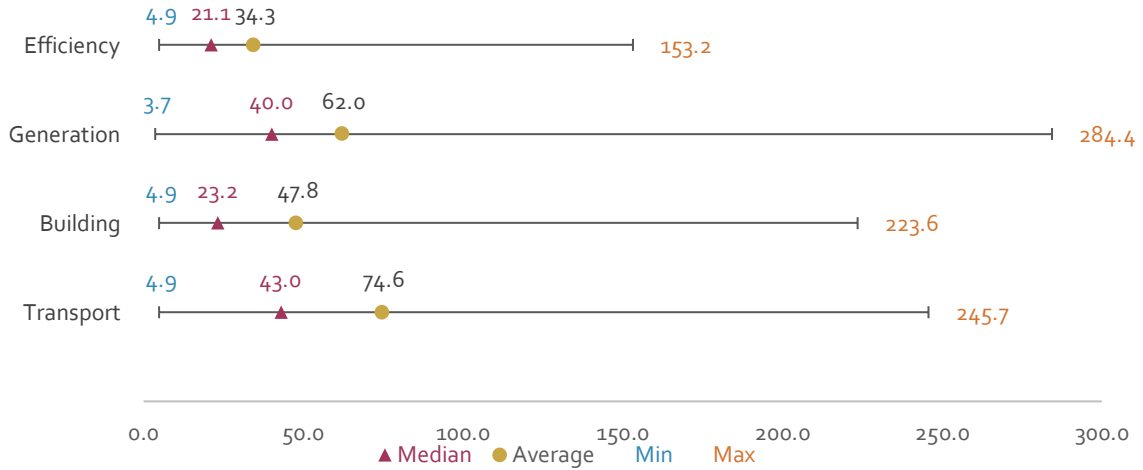
Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

Note: * means all components of a project is related to energy, while ** means some components of a project is related to energy.

259. As shown in Table 5–1, the average cost-effectiveness for GCF energy projects varies between USD 15.22/tCO₂e for energy efficiency and USD 28.62/tCO₂e for energy access and generation, which is much lower than the HLCCP recommendations. But it must be borne in mind that the GCF contribution is providing partial financing to the projects. When looking at the overall energy project financing (Table 5–2), average cost-effectiveness is **USD 61.65/tCO₂e**, which is within the range of HLCCP recommendations and in line with other MDBs. We can confirm that **the GCF's investment in the energy sector has been cost-effective** compared to those of other public finance institutions and development agencies. However, since the GCF is meant to take risks and provide concessional finance below market rates, one could have expected to see a GCF cost-effectiveness value on the higher end of the HLCCP, which is the case for individual projects as shown in Table 5–2.
260. **Energy efficiency projects are the most cost-effective project type, at USD 34.3/tCO₂e, followed by buildings and urban systems (USD 47.8/tCO₂e), energy access and power generation (USD 62.0/tCO₂e), and low-emission transport (USD 74.6/tCO₂e) projects.**
261. Cost-effectiveness was analysed by four classifications based on the sectoral guides: *Energy access and power generation*; *Cities, buildings and urban systems*; *Low emission transport*; and *Energy efficiency*. Average cost-effectiveness by category ranges between USD 34.3 and 74.6 per tCO₂e, as shown in Figure 5–2.

Figure 5–2. Cost-effectiveness for GCF energy projects by type

(USD/tCO_{2e})



Source: Tableau Server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

262. The team conducted further analysis on the GCF's investments in the energy sector and also examined the cost-effectiveness across regions and sub-sectors. This analysis is presented Volume II of the report, and utilizes key investment categories tagged according to the GCF taxonomy. On average, hydropower projects demonstrate higher cost-effectiveness at USD 9.94/tCO_{2e}, with a data range between USD 3.86 and USD 17.97 per tCO_{2e}. In comparison, solar projects have an average cost of USD 66.54/tCO_{2e}, within a range of USD 3.65 to USD 245.75 per tCO_{2e}, and wind projects have an average cost of USD 60.29/tCO_{2e}, within a range of USD 30.28 to USD 97.53 per tCO_{2e}. It is important to note that the data set for hydropower projects is limited. The projects tagged as Grid or Distribution/Transmission have very similar cost-effectiveness overall, but it costs more to reduce the same amount of CO₂ compared to the projects tagged as Off-grid or Battery/Energy storage projects. As for cost-effectiveness across regions, we did not observe a large variation; however, we find that, at USD 33.26/tCO_{2e}, multi-region projects are slightly more cost-effective than single region projects.

Chapter 6. COMPLEMENTARITY AND COMPARATIVE ADVANTAGE OF THE GCF

KEY FINDINGS

- The paradigm-shift pathways and the priorities in the energy sector of other climate funds tackle the same issues as each other – namely, power generation, renewable energy and energy efficiency – although each fund articulates its energy sector approach differently.
- The strategies and approaches of MDBs are not necessarily aligned with GCF paradigm-shift pathways, but globally they tackle the same issues – namely, power generation, renewable energy and energy efficiency – but the one aspect that distinguishes the MDBs' approach from that of the GCF is their emphasis on supporting energy governance.
- The GCF is able to mobilize large volumes of debt and other reimbursable financing at deeply concessional prices, as well as non-reimbursable funding, unmatched by other agencies or in the market.
- The GCF can unlock investments in countries where public sector debt limits governments' ability to leverage international finance.
- The GCF's concessional loans for private sector projects are generally perceived as attractive due to their lower interest rates. However, blending requirements can lessen this advantage.
- GCF support in the energy sector is deemed additional, according to evidence. Most energy sector projects would not have occurred in the absence of GCF funding.

A. ENERGY SECTOR APPROACH OF MULTILATERAL CLIMATE FUNDS

263. **The paradigm-shift pathways and the priorities in the energy sector of other climate funds tackle the same issues – namely, power generation, renewable energy and energy efficiency – although each fund articulates its energy sector approach differently.**
264. Two multilateral climate funds' approaches to energy policy and strategy have been reviewed and framed by this evaluation according to the GCF paradigm-shift pathways outlined in the sectoral guides. The two selected funds are the CIF and the GEF, which are, with the GCF, the most important multilateral climate funds supporting the energy sector. The evaluation has also examined other aspects of those funds that may have an impact on GCF energy sector projects. The main findings and differences in terms of support offered by the GCF compared to the other two funds are as follows:
- **Financing amounts:** The GCF offers the largest financing quanta, with more than USD 250 million available per project for selected AEs. The CIF's Clean Technology Fund (CTF) offers USD 50 million, and the GEF focuses on much smaller amounts.
 - **Enabling environment:** The CIF and the GEF offer enabling environment windows similar to the GCF's RPSP, to support upstream activities such as strengthening countries' institutional capacities, implementing governance mechanisms, and ensuring a proper enabling environment for future projects and programmes.
 - **Project preparation assistance:** All three funds offer project preparation assistance, with the GCF offering the highest amount at USD 1.5 million per application, followed by the CIF with USD 1 million and the GEF with up to USD 300,000. In practice, these amounts are calibrated to the size of the possible investment.
 - **Country coverage:** The GEF can provide support in 164 countries. However, the amount that individual countries can receive is limited by its system for transparent allocation of resources (STAR) country allocations (Global Environment Facility, 2022), whereas the GCF can support projects in 148 countries without any country allocation limitations. Until now, 129 developing countries have had a GCF project approved. The CIF supports only 72 low- and middle-income countries worldwide.
 - **AEs / executing entities:** The GCF has a very different approach from the CIF and the GEF, which respectively only work with six MDBs and 18 global, regional and national financial institutions or organizations. The GCF is the only fund working with a large array of 78 AEs from the public and private sectors, including global, regional and national financial institutions and organizations, as well as some project developers, NGOs and civil society organizations.
265. The GCF details its energy sector approach in several sectoral guides, whereas the CIF does not have an energy approach document but presents its approach through its numerous programmes. The GEF takes a very synthetic approach in its *Climate Change Mitigation* brief, covering each theme (access, renewable energy and energy efficiency) in a very comprehensive manner (Global Environment Facility, 2023). Therefore, the GCF's energy sector approach is the most detailed among the three funds but is also the most complex to understand, as already mentioned in this report. Table 6–1 illustrates the similarities and differences between the funds' energy sector priorities. A comparison of other relevant characteristics can also be found in Volume II of the report.
266. **Renewable energy:** The GCF renewable energy approach is broken down into various sectoral guides, among which the most relevant ones are *Energy access and power generation* and *Cities*,

buildings and urban systems, which tackle the scaling up of distributed renewable energy. The approaches of both the CIF and the GEF emphasize the need for supporting **integration** of renewable energy in the grids. The CIF approach is divided into two programmes: the Renewable Energy Integration Program and the Scaling Up Renewable Energy Program in Low Income Countries. The GEF takes a comprehensive approach by including power generation and scaling up energy access through renewable energy.

267. **Energy efficiency:** Energy efficiency is treated as a cross-sectoral issue by all three funds. The GCF presents energy efficiency in all 10 sectoral guides, the most relevant being *Energy efficiency*, of course, and *Cities, buildings and urban systems*, which tackles energy efficiency in buildings. The CIF's CTF supports energy efficiency in all sectors without being very specific, whereas the GEF emphasizes the necessity of supporting energy efficiency policies. The GCF approach, although more spread out, covers more aspects of energy efficiency (paradigm-shifting pathways). Nevertheless, the support of energy efficiency policies is not presented as a paradigm-shifting pathway but only as an action under transformational planning and programming, thereby understating its importance.
268. **Transport:** Both the GCF and the GEF highlight support for zero-emission transport, whereas the CIF's CTF only mentions supporting clean transport.

Table 6–1. Comparison of the energy approaches of multilateral climate funds

GCF PARADIGM SHIFT PATHWAYS	OTHER MULTILATERAL FUNDS			
	CIF		GEF	
Energy access and power generation	Low-emission power generation	The Renewable Energy Integration Program aims to increase the flexibility of energy systems to enable the smooth integration of higher shares of intermittent renewable energy generation into developing and emerging countries' energy mix.	GEF-8 Climate Change Focal Area Strategy and Associated Programming Pillar I: Promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts	Obj. 2: Enable the transition to decarbonized power systems, to increase the pace of renewable energy growth and integration into the grid through long-term plans and models.
	Efficient and reliable energy transmission, distribution and storage			
	Promoting access to modern renewable energy	The SREP in Low Income Countries supports the scaled-up deployment of renewable energy solutions, such as solar and geothermal, to increase energy access.		
Cities, buildings and urban systems	Decarbonization of urban energy systems by scaling up distributed renewable energy	The CTF supports a wide array of clean technologies across different areas, including energy efficiency (of buildings, agriculture and industry).		Obj. 1: Accelerate the efficient use of energy and materials, by investing in the adoption of a new generation of energy efficiency
	Energy efficiency in building stock			
Energy efficiency	Compact and resilient urban development			
	Scaling up industrial energy efficiency			
	Enhancing “space”			

GCF PARADIGM SHIFT PATHWAYS	OTHER MULTILATERAL FUNDS		
	CIF		GEF
	energy efficiency		policies.
Low-emission transport	Accelerating shift to low-emission public transport Rapidly electrifying transport systems Supporting scaleup of new generation zero-emission fuels for not yet electrifiable uses	The CTF supports a wide array of clean technologies including clean transport.	Obj. 3: Scale up zero-emission mobility of people and goods to support integrated approaches to support the transition towards zero-emission mobility.

Source: Climate Investment Funds (n.d.); Global Environment Facility (2023); Green Climate Fund (2021c; 2022c; 2022f; 2022g).

Note: The CTF, which is part of the CIF, is currently conducting a review of its strategy in terms of the focus areas and thematic areas where the CTF can or would like to have an impact.

B. ENERGY SECTOR APPROACH OF MDBs

269. **The strategies and approaches of MDBs are not necessarily aligned with GCF paradigm-shift pathways, but globally they tackle the same issues – namely, power generation, renewable energy and energy efficiency. The one aspect that distinguishes the MDBs’ approach from that of the GCF is their emphasis on supporting energy governance.**
270. The evaluation also reviewed and framed the strategies and approaches of MDBs according to the GCF paradigm-shift pathways outlined in the sectoral guides. As shown in Table 6–2, these are not necessarily aligned, but globally they tackle the same issues – namely, power generation, renewable energy and energy efficiency. There is one aspect that distinguishes the MDBs’ approach from the that of the GCF: the MDBs’ emphasis on energy governance.
271. **Energy governance:** Almost all MDBs emphasize the need for extensively supporting the enabling environment by improving energy governance, including institutions, regulation, policies and information. The GCF supports the enabling environment through the RPSP, but support for the enabling environment is not one of the energy paradigm-shifting pathways, so it is not systematically integrated in energy sector projects. Unlike the GEF and MDBs, the GCF, according to its Innovation and Additionality Tool,³¹ does **not** consider “project activity enables regulatory change” as being additional, which may explain why the “enabling environment” aspect is not part of energy paradigm-shifting pathways.
272. **Renewable energy:** There are two specific issues that multilateral agencies clearly mention in their energy approach and that are not present in the GCF paradigm-shifting pathways: (i) the integration of renewable energy into grids, also mentioned in the comparative analysis with other climate funds, and (ii) the need for more regional power cooperation. MDBs put forward the importance of proper planning of the integration of renewable energy on existing grids to ensure the decarbonization of power generation as well as scaling up of renewable energy. Regional cooperation can also play an important role, especially for LDCs, SIDS and other small countries. Two MDBs also highlight the

³¹ As explained on the GCF website, “This Innovation and Additionality Tool (IAT) is being developed specifically to assess the additionality of concept notes and funding proposals for projects and programmes as put forward to the GCF.” Further details are available at <https://www.greenclimate.fund/document/innovation-and-additionality-tool>.

need for supporting clean cooking, as does the GCF, confirming the importance of supporting this subsector.

273. **Energy efficiency:** Energy efficiency priorities outlined in MDBs' approaches are quite broad but still in line with that of the GCF. Nevertheless, the above-mentioned need for better energy governance and policies represents an important aspect of the support provided by MDBs around energy efficiency by improving policies, regulations for equipment and building codes.
274. Barriers to achieving universal access to energy include uncertain macroeconomic outlook, high levels of inflation, currency fluctuations, debt distress in a growing number of countries, lack of financing, lack of policy actions, supply chain bottlenecks, tighter fiscal circumstances, soaring prices for materials, and political and legal barriers (International Energy Agency and others, 2023; Falchetta and others, 2022).

Table 6–2. Comparison of the energy approaches of the GCF and MDBs

GCF		WB / IFC	IDB	ADB	AfDB	EBRD
Energy access and power generation paradigm-shifting pathways	Low-emission power generation	<ul style="list-style-type: none"> Power sector planning, energy subsidy reforms Improvements to the operational and financial performance of utilities 	<ul style="list-style-type: none"> Energy security: energy infrastructure and regional energy integration for the provision of reliable services 	<ul style="list-style-type: none"> Support the development of affordable and reliable energy systems with substantial additional electricity-generating capacity, and flexible power systems that can balance fluctuations in demand and supply. 	<ul style="list-style-type: none"> Explore viable sources of renewable energy including hydropower, bioenergy, wind, solar, ocean and geothermal resources. Promote an integrated approach for planning balanced energy mixes that include both renewable and non-renewable sources. 	<ul style="list-style-type: none"> Cleaner oil and gas value chains limited to supporting the transition to low-carbon economies and consistent with the Paris Agreement
	Efficient and reliable energy transmission, distribution and storage	<ul style="list-style-type: none"> Regional power cooperation and trade 		<ul style="list-style-type: none"> Support strong, resilient, efficient and flexible transmission and distribution networks, support the extension of existing grids where appropriate and the deployment of new technologies such as renewable energy-based microgrids. Promote regional energy cooperation and the integration of energy systems to strengthen energy security and increase cross-border access to cleaner energy sources. 	<ul style="list-style-type: none"> Scaling up of investments in power transmission and distribution at the national and regional levels. Accelerating major regional projects to drive integration by increasing on-grid generation, on-grid transmission and new grid connections. 	<ul style="list-style-type: none"> Energy markets that are competitive, regionally integrated and resilient, by supporting electricity networks and different types of gas infrastructure
	Promoting access to modern renewable energy	<ul style="list-style-type: none"> Increase energy access, including through renewable 	<ul style="list-style-type: none"> Energy access: coverage, quality, reliability, and affordability in 	<ul style="list-style-type: none"> Bring affordable, reliable, sustainable and modern energy to all, so as to eradicate extreme poverty and reduce social inequalities, 	<ul style="list-style-type: none"> Support conducive policy and regulatory frameworks, as well as create market conditions. 	<ul style="list-style-type: none"> Decarbonized economies that are highly efficient, electrified by

GCF		WB / IFC	IDB	ADB	AfDB	EBRD
		energy	the provision of energy services	including universal access to electricity, and clean cooking and heating options for all households.	<ul style="list-style-type: none"> Support energy access programmes, particularly for women by increasing off-grid new connections and access to clean cooking energy. 	mainly renewable energy sources
Energy efficiency paradigm-shifting pathways	Scaling up industrial energy efficiency	<ul style="list-style-type: none"> Improved energy efficiency 	<ul style="list-style-type: none"> Energy sustainability: energy efficiency, renewable energy, climate change mitigation and adaptation, and reduction of environmental impacts in the long term 	<ul style="list-style-type: none"> Improve end-use energy efficiency. Support the construction, expansion, efficiency improvement, and rehabilitation of district heating networks. Promote clean and efficient heating supply and cooling solutions. Support demand-side energy efficiency planning. 	<ul style="list-style-type: none"> Help countries identify and implement options to reduce losses arising from production, transmission, distribution and end-use inefficiencies. 	<ul style="list-style-type: none"> Inclusive and energy-efficient economies that promote gender equality and promotion of demand and supply-side energy efficiency
	Enhancing “space” energy efficiency					
	Catalysing rapid market switch to highest-efficiency appliances/ equipment					
Other considerations		<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Energy governance: institutions, regulation, policies, and information enabling the sector’s long-term economic and financial sustainability 	<ul style="list-style-type: none"> Promote increased demand-side energy efficiency through policy support. Support the institutional development, financial sustainability, and good governance of energy sector institutions and companies, as well as private sector participation. 	<ul style="list-style-type: none"> In policy dialogue, work with governments and other relevant agencies to emphasize the importance of energy efficiency. Rolling out waves of countrywide energy “transformations” and setting up an enabling policy environment. 	<ul style="list-style-type: none"> Deliver sustainable energy for all, through governance and practices of state own enterprises and energy companies

Source: African Development Bank (2012); Asian Development Bank (2023); European Bank for Reconstruction and Development (2018); Inter-American Development Bank, Energy Division (2018); World Bank Group (2021).

275. Based on the analysis above and on an expert review, the evaluation team has proposed the areas where the GCF investment may find greatest opportunities (Table 6–3).

Table 6–3. Energy subsectors and greatest potential opportunities for the GCF

ENERGY SUBSECTORS	GCF OPPORTUNITIES
Energy generation	There is an opportunity for the GCF to diversify its energy generation portfolio in terms of technology, especially focusing on using solar thermal to supply domestic hot water needs. To support the electrification of end uses, solar PV is still an option, for which developing countries need support.
Energy access	The GCF could consider linking energy access projects with an energy efficiency approach for electric equipment and appliances, including clean cooking technologies to be supplied by the grid, including mini-grids.
Energy transmission and distribution	The GCF can continue to support the integration of renewable energy in grids. Also, the GCF should increase its support for enabling regulatory frameworks aimed at easing the connection of renewable energy power plants (i) to existing grids and (ii) in large-scale upgrades to existing transmission and distribution networks to enable a high percentage of intermittent electricity production.
Energy storage	There is an opportunity for the GCF to continue to support small- to medium-scale storage projects, especially those linked to energy access. The GCF should also start to support large-scale on-grid storage solutions, which will enable a drastic increase in the percentage of clean electricity in national grids.
New energy sources	The GCF has an opportunity to increase its support for new or emerging energy sources, to support innovative technologies and future solutions. Many governments are currently pushing hydrogen as “the solution” to fight climate change, but the GCF should stick to its diversified approach in terms of technology.
Energy efficiency	The GCF should greatly enhance its support for the enabling environment around reducing energy consumption through appropriate energy efficiency regulations frameworks as well as appropriate energy tariffs. Energy efficiency should be seen as prerequisite to installing small-scale renewable energy projects, to avoid a rebound effect and an unnecessary increase in energy consumption.
Low-emission transport	The GCF has an opportunity to continue to support projects aimed at increasing low-emission public transportation systems, including road and rail modalities.

Source: Assessment by the evaluation team.

C. COMPARATIVE ADVANTAGE

276. Based on interviews with local, regional and international institutions specialized in energy project financing, the evaluation identified several advantages of the GCF compared to other donors in the field of climate finance.
277. **The GCF is able to mobilize large volumes of debt and other reimbursable financing at deeply concessional prices, as well as non-reimbursable funding, which is unmatched by other agencies or in the market.**

1. SIZE/SCALE OF CONCESSIONALITY

278. The GCF secures non-reimbursable (grant) funding for climate finance in much larger volumes than any of the other international and bilateral financial institutions (e.g. IBRD, African Development

Bank (AfDB)) or other climate funds (e.g. CTF, GEF). This enables the GCF to offer debt or other reimbursable financing at deeply concessional prices, unmatched in the market. Because of this, the GCF can finance projects and engage in the energy sectors of developing countries where the market is in early development stages, and where more market-oriented financing conditions cannot address the existing barriers. This is particularly important for energy access projects, where investments are not commercially viable and are made primarily for their market/societal development impact.

279. This ability to mobilize large volumes of deeply concessional financing is the GCF advantage most recognized by interviewees. It is much more pronounced/appreciated in the energy sectors of SIDS, where the small size of markets makes them unattractive for investors looking to deploy funding at scale. It is also very valuable for LDCs, where the lack of sophistication of the markets, barriers to entry for new technologies and general lack of capacity of market stakeholders make the transaction cost of deploying energy sector projects too high for conventional development financing.

2. DIFFERENT FUNDING MODALITIES

280. In interviews with market stakeholders, the diversity of the financing instruments available from the GCF (senior loans, grants, guarantees, subordinated loans and equity) was mentioned as a competitive advantage. The different instruments provide the flexibility to adapt not only to the specificities of the energy sectors of different countries but also to the particular needs of the financing partners (the AEs). Different financial instruments can address different market barriers or accommodate different investor risk/return appetites. For example, solar PV projects led by AEs followed a common pattern of reducing financial risk, which made these projects more appealing to private sector investors and, at the same time, generated demand in the market for such projects.
281. A common perception of conventional finance is that development organizations are trying to “sell” the products (typically debt) they have in their arsenal, regardless of the specific market needs at that point in time. The fact that the GCF’s investments are led by AEs, enables AEs to better leverage private sector capital and to better address market needs, by developing (with GCF support) blended finance instruments, where the GCF’s support is used to address market risks that are preventing other investors from entering these markets. This is particularly important in the energy sector, where renewable energy and energy efficiency investments are generally new for local investors and consequently perceived as risky. The GCF’s grant funding, first-loss risk-sharing instruments, and equity and quasi-equity financial products serve as an anchor to other investors by de-risking energy sector projects. The RPSP, as a funding modality, has the potential to add substantial value as a precursor to GCF investments in the market, supporting necessary policy and regulatory reforms, framework enhancements and capacity development (especially in energy efficiency) to prime the market for follow-up investments.³²
282. **The GCF can unlock investments in countries where public sector debt limits governments’ ability to leverage international finance.**
283. International development organizations partnering with the public sector in different countries typically require a sovereign guarantee on the financing they provide (e.g. *Kreditanstalt für Wiederaufbau* (or KfW), IBRD, ADB). Development organizations partnering with private sector players directly (e.g. Proparco, *Deutsche Investitions- und Entwicklungsgesellschaft* (the private arm of KfW), International Finance Corporation (IFC)) need financially solid and sophisticated local financial institutions to deploy their funding. In SIDS and LDCs in particular, governments are very

³² In total, 95 RPSP grants are related to the energy sector, representing 11 per cent of the approved amount.

often at their borrowing limit. Leveraging additional international funding becomes more difficult, and governments need to prioritize where to direct this funding.

284. Not entirely by accident, the GCF is expected to pay attention to the needs of vulnerable countries, while many international organizations are also accredited to the GCF. In this context, the GCF (through its concessional and risk-taking product modalities) is able to leverage international financing, which would have otherwise required a sovereign guarantee. This is particularly important for the energy sector, **where renewable energy or energy access infrastructure requires the long-term risk exposure of investors.** For SIDS in particular, the problem of excessive indebtedness of many governments is compounded by the fact that energy sector project investments are smaller. Large international investors have less interest, and smaller regional investors are more risk-averse. Consequently, the GCF plays a key role as an investment catalyst, de-risking energy sector investment for the international development finance community and private sector investors.
285. SIDS, notably, suffer from an important lack of human resources, which negatively impacts their capacity to cope with the requirements of the project cycle. Moreover, SIDS' climate financing needs are not met through current climate and development finance. This is due to a lack of recognition of the particular challenges faced by SIDS in the financing system, leading to access and opportunity restrictions (United Nations, 2022). The GCF has invested USD 544 million in 18 energy sector projects (excluding multi-region projects) in SIDS. This represents 13 per cent of investments and 20 per cent of energy projects (excluding multi-region projects).

3. FLEXIBILITY DUE TO THE ABSENCE OF COUNTRY OR SECTOR INVESTMENT LIMITS

286. Most other development organizations and donor agencies have region- and/or country-based allocation limits, and when these limits are reached, they can no longer deploy funding to certain markets within a given programming period. The GCF has no such investment limits or restrictions by country, or restrictions or priorities by results areas or sectors. This level of flexibility is particularly valuable in markets where larger amounts of financing are needed to generate market momentum and trigger a paradigm shift.
287. **The GCF's concessional loans for private sector projects are generally perceived as attractive due to their lower interest rates. However, blending requirements can lessen this advantage.**
288. Stakeholders generally assess the GCF's concessional loans in private sector projects as attractive, thanks to their lower interest rates compared to commercial loans and other development agencies.

4. REGIONAL COVERAGE

289. A direct comparison of the regional distribution of the GCF portfolio and those of other agencies is not possible. The GCF tracks projects according to continental breakdown, in accordance with the UNFCCC and based on the tradition of the United Nations to organize countries into five regional groups – namely, African States, Asia-Pacific States, Eastern European States, Latin American and Caribbean States, and Western European and Other States.³³ All MDBs track projects according to a different geographic distribution, corresponding to subregions that regroup countries having similar socioeconomic conditions, cultural or geographic characteristics. These are Central Asia, East Asia

³³ The "Other States" include Australia, Canada, Iceland, New Zealand, Norway, Switzerland and the United States of America. Japan is in the Asia-Pacific States group. Further information is available at <https://unfccc.int/process-and-meetings/parties-non-party-stakeholders/parties/party-groupings>.

and the Pacific, the European Union, Europe: Non-EU, Latin America and the Caribbean, the Middle East and Northern Africa, South Asia, and sub-Saharan Africa. It is thus difficult to compare exactly the GCF energy sector breakdown with those of MDBs, especially for Africa.

290. Looking at the overall regional balance of GCF energy sector investments, the largest percentage was for multi-region projects at 32 per cent, followed by projects in the Asia-Pacific region at 29 per cent, Africa at 21 per cent, Latin America and the Caribbean at 17 per cent and Eastern Europe at 1 per cent (Table 6–5).³⁴ According to DataLab, the high proportion of investments in multi-region projects obscures understanding of flows to individual regions and the most vulnerable countries.
291. When looking at global figures for 2022, only 3 per cent of MDB investments went to multi-region projects, whereas Africa and the Middle East received the highest share of investment at 35 per cent; followed by Asia-Pacific (South Asia, Central Asia, East Asia and the Pacific) 32 per cent; Latin America and the Caribbean 21 per cent; and Europe (mostly Eastern Europe) 9 per cent. However, when looking at energy sector investments only, coverage changes dramatically because of the high investments in the European Union as shown in Table 6–4. Taking out the European Union to use comparable figures for energy sector projects, only 7 per cent of MDB investments went to multi-region projects, while Africa and the Middle East and Asia-Pacific received the highest shares, at 33.5 and 33.7 per cent, respectively, followed by Latin America and the Caribbean 17.1 per cent, and Europe (Non-EU, mostly Eastern) 8.6 per cent (European Investment Bank, 2023).

Table 6–4. Total MDB adaptation and mitigation finance in the energy sector by region

(USD million, 2022)

REGION	ADAPTATION	MITIGATION		TOTAL	BREAKDOWN
	Energy, transport, built environment and infrastructure	Energy	Buildings, public installations and end-use energy efficiency		
Central Asia	156	888	163	1,207	3.1%
East Asia & Pacific	751	1,519	275	2,545	6.6%
European Union	695	13,429	1,902	16,026	41.4%
Europe: non-EU	517	1,200	240	1,957	5.1%
Latin America and the Caribbean	721	2,552	613	3,886	10.0%
Middle East and North Africa	134	901	462	1,497	3.9%
South Asia	2,301	1,272	332	3,905	10.1%
Sub-Saharan Africa	2,265	3,243	604	6,112	15.8%
Multi region	28	1,136	430	1,594	4.1%
Total	7,566	26,140	5,022	38,728	

Source: European Investment Bank (2023).

Note: Items in columns may not sum to totals due to rounding.

³⁴ However, GCF investment in the energy sector has not been stable or equal per region over time. Not all regions are represented in energy project proposals approved at each Board Meeting, and some regions are not represented for three or four meetings in a row. For example, at B.36, 88 per cent of GCF investment in the energy sector went to Africa, whereas the previous time that any GCF investment in the energy sector went to Africa was at B.31. Eastern Europe has not had any energy sector projects approved since B.26.

Table 6–5. Comparison of geographical distribution of investment in the energy sector between the GCF and MDBs

REGION	GCF	MDBs
Multi region	32%	7%
Asia-Pacific	29%,	33.7%
Africa	21%	33.5%*
Latin America and the Caribbean	17%	17.1%
Eastern Europe	1%	8.6%**

Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab; and European Investment Bank (2023).

Note: * includes Middle East; ** includes all non-EU, which are all in Eastern Europe.

292. The difference in multi-region energy project investments between the GCF and MDBs is striking, as is the difference in investments going to Africa. At first glance, it may look like the GCF is under-investing in Africa compared to MDBs, but since the regional breakdown for Africa and the Middle East cannot be distinguished for MDBs, the comparison is not exact. Still, it would be surprising if the Middle East represented 12.5 per cent of MDBs’ investments, considering its small population compared to Africa. Furthermore, out of the 15 GCF multi-region energy sector projects, 14 have been implemented in an African State. However, the proportion of regional investments channelled to African countries is not possible to determine. There are also other factors to consider. Many MDBs under consideration are regional MDBs, with specific regional focus.

5. COUNTRY COVERAGE

293. The GCF has extensive country coverage. In total there are 197 parties to the UNFCCC, of which 154 are non-annex 1 countries and 148 have designated an NDA or a focal point.³⁵ Hence, the GCF can support projects in those 148 countries, without apparent country allocation limitations. For GCF adaptation funds, at least 50 per cent are to be allocated to LDCs, SIDS and African States. This enables regional development organizations, such as the AfDB, Caribbean Development Bank and national development banks and agencies, to access one more source of finance, with diverse financial products that either address unmet market demand for financing or are able to enhance the value of the products and services offered by other development organizations in these markets. The GEF has even more extensive country coverage because it can support 164 countries. However, individual country support by the GEF is limited by its STAR country allocations (Global Environment Facility, 2022). The CIF has a more limited coverage, since it supports climate projects in only 72 low- and middle-income countries worldwide.³⁶ The World Bank Group works in more than 170 countries and has offices in over 130 locations, ensuring the most extensive coverage among the MDBs.
294. Several small island countries and territories are not eligible to receive concessional funds,³⁷ despite large needs and limited national resources to invest. It can be argued that income levels are not a relevant metric in this context, as high-income SIDS are highly vulnerable to climate change and require vast support for resilient measures. Regional or bilateral agencies can sometimes cover some

³⁵ The full list of countries with an NDA / focal point is available at <https://www.greenclimate.fund/countries>.

³⁶ The full list of CIF Program Countries is available at <https://www.cif.org/where-we-work>.

³⁷ This is due to rules on aid eligibility set out by the Organisation for Economic Co-operation and Development Development Assistance Committee, using income per capita as a main criterion.

of those gaps. For example, the Caribbean Development Bank can support energy projects in Anguilla, British Virgin Islands and Montserrat (which is overseas development aid eligible), whereas other MDBs or climate funds do not. Similarly, the AFD supports energy projects in the State of Palestine, although no MDBs or climate funds do. There is thus an opportunity for the GCF to work more closely with such agencies to provide support in contexts where other climate or development funds may be more limited (Box 6–1).

D. ADDITIONALITY

295. **The GCF has adopted a definition of additionality similar to that used by other funding agencies and has detailed it through its Innovation and Additionality Tool (IAT). AEs engaged in GCF-funded energy projects indicate that these projects would not have taken place without GCF support – meeting the basic test of additionality.**
296. The IAT defines additionality as follows: “A project or programme is considered additional if it would not have occurred in the absence of GCF funding” (Green Climate Fund, 2022e). The GEF has a similar definition. In the GCF IAT, four dimensions of additionality are presented:
- **Baseline context and alternatives:** Proposed project/programme can demonstrate project alternatives and presents a comparative analysis between proposed interventions and these alternatives
 - **Non-financial barriers in the country:** Proposed project/programme addresses non-financial barriers to low-carbon/climate-resilient investment in the context of reference that would otherwise prevent the project from happening
 - **Financial barriers in the country:** As in Dimension 2, but specifically for financial barriers
 - **Innovation and second-order effects of the intervention:** Proposed technology is first-of-a-kind or otherwise new in design or application
297. Unlike the GEF and MDBs, the GCF’s IAT considers that the following do not deliver additionality:
- Project activity enables resource mobilization
 - Project activity enables regulatory change
 - Project activity promotes adoption of higher ESS
298. It should be noted that the IAT is primarily used at the concept note stage, before an AE develops a full FP package. The tool may also be applied to full FPs if a concept note has not been submitted beforehand. Although the IAT tool is being used to evaluate concept notes and FPs, neither the qualitative nor the quantitative scores regarding the additionality of those FPs are being monitored or reported in the GCF databases, since additionality is considered as a prerequisite for a proposal to even be evaluated. So, while all approved FPs comply with the IAT, we cannot comment on the scoring (or level) of additionality for energy sector projects or for any other project characteristics.
299. Several interviewed stakeholders from IAEs and regional and national DAEs, including MDBs, confirmed that their energy project would not have taken place in the absence of GCF financial support, which corresponds to the definition of additionality. As stated in the previous section, the GCF is able to provide concessional finance particularly in contexts of vulnerability. The additionality of the GCF energy portfolio is primarily related to the contexts of GCF FPs and is highly relevant in contexts with high financial and non-financial barriers (see Box 6–1 below).

Box 6–1. Improving clean energy access in SIDS

The project FP020, Sustainable Energy Facility (SEF) for the Eastern Caribbean, is supporting Dominica, Grenada, Saint Kitts & Nevis, Saint Lucia, and Saint Vincent & Grenadines (known as the 5ECC). These countries are all SIDS located in the Eastern Caribbean region, with small and isolated electricity markets, highly dependent on imported liquid fossil fuels for electricity generation. However, they are all volcanic islands with potential for geothermal energy. The initial exploration drilling is very costly and is unaffordable for SIDS. The Inter-American Development Bank (IDB) initially secured funds from the CTF (USD 19 million) and the GEF (USD 3 million) in 2015. Since IDB cannot work directly in the 5ECC, it channelled those funds through the Caribbean Development Bank (CDB). IDB was able to expand the SEF thanks to GCF co-financing. This co-financing is all channelled through the CDB, which is also able to blend other funds from EIB, a Canadian facility and the United Kingdom.

The GCF contribution enabled scaleup of the SEF project and unlocked investment in subsequent stages through support with contingent recovery grants and grants. Furthermore, the grant serves to provide technical assistance for a regulatory framework, institutional strengthening and capacity-building of ministries and utilities, which is greatly needed in these SIDS and contributes to the sustainability of the project.

This project is an example of how the GCF can contribute to improving clean energy access to SIDS by providing the right financing instrument, accompanied by technical assistance, while only bringing 42 per cent of the total financing. This project will also contribute to a paradigm shift for these SIDS because they will gain access to clean energy and electricity instead of relying on diesel-generated electricity. This project would not have occurred without the GCF support, confirming its additionality.

Source: DataLab analysis of APRs and interviews.

300. According to interviewees, vulnerable countries, including African States, LDCs and SIDS, have been able to benefit from GCF support to some extent. To properly analyse the GCF involvement in vulnerable countries, the 15 multi-region projects have been excluded from the analysis. The GCF has invested in 55 projects in vulnerable countries, representing 61 per cent of all single-country energy sector projects. IEU DataLab portfolio analysis found that within the vulnerable countries category, the GCF has invested in energy sector projects in African States (33 projects), LDCs (38 projects) and SIDS (18 projects), although due to the overlapping figures, since countries can belong to more than one of these categories, the proportion may be misleading. Nevertheless, the greatest challenge that SIDS, and to a lesser extent LDCs, face in accessing GCF finance is their lack of capacity to develop concept notes and FPs that meet the GCF standard (Independent Evaluation Unit, 2020). Without this challenge being addressed, financing to SIDS and LDCs will most likely stagnate or depend entirely on IAEs presenting such concept notes and FPs.
301. In 2022, 10 MDBs committed USD 11,663 million in climate finance to LDCs (Table 6–6). Most of the climate finance provided to LDCs was from the MDBs' own accounts, with only USD 1,287 million (11 per cent) coming from MDB-managed external resources. A total of USD 2,213 million was committed for climate change finance for low- and middle-income SIDS, including USD 191 million from MDB-managed external resources. Additionally, a total of USD 630 million was committed for climate change finance for countries that belong to both the LDCs and SIDS categories, with only USD 27 million from MDB-managed external resources. Hence, in 2022, a total of USD 14,520 million in MDB external resources, of which the GCF formed a part, was committed for climate change finance for SIDS and LDCs (European Investment Bank, 2023). In the energy sector only, finance to LDCs and SIDS totalled USD 7,293 million for the year 2022,

which was 59 per cent of the total climate finance (across mitigation and adaptation). In comparison, since 2015 the GCF has invested USD 2,113 million in energy projects in LDCs and SIDS. While this may seem small, the GCF has a relatively large share, considering the overall climate finance envelope of the MDBs.

Table 6–6. MDB climate finance for LDCs and SIDS

(USD million, 2022)

	LDCs THAT ARE NOT SIDS	SIDS THAT ARE NOT LDCs	LDCs AND SIDS	TOTAL	SHARE
Mitigation finance	5,292	1,202	134	6,628	45.6%
Adaptation finance	6,385	1,011	496	7,892	54.4%
Total	11,677	2,213	630	14,520	100%
Mitigation: energy and buildings, public installations and end-use energy efficiency	3,742	417	61	4,220	
Adaptation: energy, transport, and other built environment and infrastructures	2,418	406	249	3,073	
Energy total (mitigation and adaptation)	6,160	823	310	7,293	59%

Source: European Investment Bank (2023)

Chapter 7. PARADIGM SHIFT, RISK AND INNOVATION

KEY FINDINGS

- At the project level, GCF energy projects have the potential to generate a paradigm shift within their scope, and there is a missed opportunity to go beyond the project level and support wholesale and profound shifts in the sector. The paradigm-shift potential (as stated in FPs) lacks the level of detail necessary for its assessment in APRs due to the lack of defined criteria/metrics for measuring paradigm shift in project proposals.
- The deployment of larger schemes and mechanisms offers true paradigm-shift potential compared to stand-alone projects.
- The GCF's strategies set the target to pursue higher risk-appetite levels than other funds, a willingness to pilot and pursue technological innovation, and a broad range of financing instruments. There is a discrepancy between the evident risk appetite and the stated risk appetite in the energy portfolio. The risk appetite for energy projects does not reflect the GCF's intentions in the energy sector.
- The GCF's energy sector portfolio demonstrates a limited risk appetite for more transformational and innovative energy technologies such as offshore wind, green hydrogen and energy storage.
- The GCF has contributed to project de-risking by providing a blend of financing instruments well suited to project requirements. However, the dominance of senior loans as a financial instrument for energy sector programming attests to a more risk-averse positioning.
- The conceptual definition of innovation has been very loose and subjective across FPs proposals and project implementation. The GCF does not track the innovation criterion in FPs but uses it in the interim evaluations of the project.
- The GCF has access modalities to support innovative approaches and business models in the energy sector; however, they have not been well utilized to date.
- There are encouraging results in innovative business models and initiatives to promote energy savings in the renewable energy sector.

A. POTENTIALS FOR PARADIGM SHIFT

302. **At the project level, GCF energy projects have the potential to generate a paradigm shift within their scope, and there is a missed opportunity to go beyond the project level and support wholesale and profound shifts in the sector. However, the paradigm shift potential (as stated in funded projects) lacks the level of detail necessary for its assessment in APRs due to the lack of defined criteria/metrics for measuring paradigm shift in project proposals.**

303. The IEU's past evaluations found that the concept of paradigm shift remains ill-understood among stakeholders, and Secretariat reporting of progress towards paradigm-shifting pathways is vague (Independent Evaluation Unit, 2020). According to the IRMF, the paradigm shift at the impact level will be promoted by

- (1) supporting projects/programmes in reporting how and to what extent projects/programmes have promoted paradigm shift potential through interventions that reduce emissions and/or increase resilience (climate impacts); and
- (2) aggregating the information gathered via projects/programmes at the impact results level of the IRMF architecture through application of three assessment dimensions (scale, replicability and sustainability), which are in turn derived from the coverage areas and activity-specific sub-criteria of the initial IF.

304. The IRMF also highlights that the paradigm-shift result will be achieved “beyond the lifetime of a project/programme and may not be directly attributable to GCF interventions only” and that the sectoral guides are expected to provide support for AEs to define paradigm shift, as relevant to each sector.

305. The evaluation looked into the APRs, and interim evaluations of the energy projects, and observed that the following examples illustrate how some GCF projects support paradigm shift in the energy sector.

- **FP026, Sustainable Landscapes in Eastern Madagascar**, is reporting signals of paradigm-shifting in energy transitions and recognizes a relational need contributing to the success of new and especially innovative programmes, and on empowering local farmers to become leaders in practice and in community knowledge management.
- **FP028, MSME Business Loan Program for GHG Emission Reduction**, introduced green financing in Mongolia, then other initiatives by other banks found confidence in the example set and followed suit.
- **FP036, Pacific Islands Renewable Energy Investment Program**, targets a shift from diesel power to renewable energy in seven Pacific SIDS and qualifies three long-term impacts as paradigm shifts: transition to low-carbon energy, increased private sector engagement, and improved energy access. However, it also recognizes that the shift cannot be activated alone, but is ultimately reliant on policy and government actions.
- **FP039, GCF-EBRD Egypt Renewable Energy Financing Framework**, is reporting that the installed solar PV plant has been a catalyst to boost renewable energy development in Egypt while enhancing the financial viability of investing in the renewable energy sector, as well as promoting the government's willingness to facilitate and support engagement from the private sector.

306. There are, however, limits to the use of APRs to understand paradigm shift. At the moment, the paradigm-shift potential as outlined in project design (FP stage) lacks the level of detail necessary for its assessment in the APRs. Due to the lack of set criteria/metrics for measuring paradigm shift at the project proposal level, it is difficult to identify evidence for evaluating potential versus actual results without carrying out a market study to identify the range and significance of external market drivers during the same period of time.

1. PARADIGM SHIFT IN ENERGY EFFICIENCY INVESTMENTS

307. The sectoral guides related to energy include a clear definition of GCF paradigm-shifting pathways. For *Energy efficiency*, three pathways are defined: (i) scaling up industrial energy efficiency by reducing the energy intensity of industrial processes and materials, catalysing innovations to reduce energy and carbon intensity, switching to low-emission fuel sources for process heat, or by shifting to new processes using electricity; (ii) enhancing “space” energy efficiency by reducing emissions from energy consumption in heating, cooling and lighting in residential, commercial, public and industrial “spaces”; and (iii) catalysing rapid market switch to the highest-efficiency appliances/equipment by supporting the adoption of “critical super-efficient appliances/equipment supply chains”.
308. In developing country markets, adoption of energy efficiency is dependent on a conducive regulatory framework, which needs to be constantly evolving to pull the market forward. Energy efficiency deployment also depends on market-based energy pricing. Countries have been able to achieve long-term impact only when the approach involved regulatory change alongside demand-side management programmes and investments. When appraising energy efficiency project proposals, the GCF has an opportunity to consider the prevalent energy regulatory framework and the expected development trends of that framework, at least for the period until the financing is deployed. Failing to do so would likely result in project failures or results lower than expected.
309. The long project appraisal cycle of the GCF makes energy efficiency projects particularly vulnerable to rapidly evolving systemic changes in energy efficiency related regulations. The effect is then compounded by the general fragmentation of the energy efficiency market segment, which makes market penetration and scaling up of investments more difficult. For these reasons, international financial institutions typically structure and deploy programmes of about USD 10–15 million in SIDS and LDCs, and up to USD 75 million in larger developing countries, before re-evaluating the market and retuning their approach. When energy efficiency support programmes fail, it is typically attributed to poor quality of programme design at market entry (i.e. a long time lag between design and implementation and structural changes in the market change the market dynamics, making the programme obsolete).

2. PARADIGM SHIFT IN ENERGY ACCESS AND POWER GENERATION

310. The sectoral guide for *Energy access and power generation* observes three distinct transformational pathways that could deliver significant and paradigm-shifting impacts during the first replenishment period (2020–2023): (i) low-emission power generation focusing on generating electricity from geothermal and renewable sources; (ii) efficient and reliable energy transmission, distribution and storage, focusing on investing in grid flexibility, digitalization and storage; and (iii) promoting access to modern renewable energy, focusing on modern renewable energy for cooking, grid connections and off-grid electricity such as green mini-grids and solar home systems.

311. Stand-alone renewable energy projects of the GCF, with low-risk from a technology point of view – namely, solar PV investments (e.g. FP017, Climate action and solar energy development programme in the Tarapacá Region in Chile, or FP046, Renewable Energy Program #1 – Solar) – can have high impact in terms of GHG emissions reduction. However, these **projects often do not contain the components necessary to trigger transformational market change**. Such transformational components would be as follows:
- Improvement of the regulatory framework related to integration of renewable energy in the grid, such as power purchase agreements, power wheeling or net metering mechanisms
 - Development of market capacity to operate and maintain the systems beyond the programme monitoring period
 - Grid upgrades and smart grid features necessary to balance and manage the intermittent nature of renewable energy
312. **The deployment of larger schemes and mechanisms offers true paradigm-shift potential compared to stand-alone projects.** For example, in FP033, in Mauritius, a solar scheme has been implemented thanks to the strong ownership of the Central Electricity Board, through a project component providing national grid codes to govern the operations of the nation's entire electricity sector's facilities. The Electricity Act was re-established, marking the beginning of a new set-up for renewable energy generation, transmission, distribution, licensing and permitting.
313. In SIDS and small countries, the GCF is able to transform the market due to the large relative size of its investments. For example, it has achieved a market transformation and a paradigm shift in Tonga and has developed renewable energy capacity at different levels in the market, which is now being used to develop further projects for different development agencies.
314. More comprehensive approaches integrating energy efficiency and renewable energy should be considered in conjunction with demand-side investments. There are numerous synergies between energy efficiency and renewable energy, which should be fostered (a good example for this is FP025, GCF-EBRD SEFF Co-financing Programme). Such integration would maximize the GHG impact by first minimizing the energy demand by the target market via energy efficiency measures and then adding a properly sized renewable energy system. When these two are evaluated separately, the most frequent result is an oversized renewable energy system, providing energy to an inefficient and energy-wasting consumer. Of all energy sector projects, about a third (36 per cent) combine renewable energy and energy efficiency components, of which 20 per cent have components that address the market framework.
315. As stated by the IPCC, energy efficiency and renewable energy synergies have a high potential to increase impact and lead to a paradigm shift. For example, cities can achieve net zero GHG emissions only through deep systemic and comprehensive transformation (Intergovernmental Panel on Climate Change, 2023).
316. The energy sectors in developing countries are rapidly evolving. This evolution is due in part to general regulatory reforms and market development, and in part due to targeted sector-specific reforms and regulatory enhancements (including introducing market-based energy pricing). Consequently, when evaluating the paradigm-shift potential of the GCF, the project-level appraisal needs to factor in and isolate the development trends in the regulatory framework(s) of the host country/region and the general market changes induced by policy reforms.
317. The GCF's paradigm-shift pathways in the energy sector are fairly framed and defined conceptually; however, the sectoral guides would benefit from clarity on how these pathways should be evaluated and the additional data (if necessary) that would need to be collected ex-ante and ex-post. As well,

the sectoral guides are missing some energy end uses that have a significant impact on the energy consumption of a country, such as public services (public lighting, water and wastewater management).

318. Market stakeholders sometimes confuse paradigm shift with sustainability, arguing that if there is a follow-up to a GCF project then that demonstrates paradigm shift (i.e. the market is adopting the GCF innovation).
319. India's FP081 is having a significant impact on market transformation in solar PV by being an early mover in PV financing. It has had a strong influence, with at least nine financial institutions now operating in the same market, thereby creating the enabling conditions for market-driven delivery at scale. A sustainable business model is now being replicated on a commercial basis. Several factors influenced the projected installed capacity and mitigation impact, including a decline in capex for solar PV rooftop systems, lower capacity factor (based on measured values) and grid emission factor as well as currency fluctuation. The project also has a gender focus, mainly on skills and jobs for women as well as support for women-led businesses in procurement. Other GCF DAEs have expressed interest in similar financing vehicles for solar PV and other technologies (e.g. waste, water, storage).
320. Although energy efficiency and renewable energy have synergies, they are often driven by more or less independent policies/regulations, which minimizes the overlap when paradigm shift is evaluated. Considering that the two segments exhibit quite different properties and market players, reacting to different market drivers, paradigm shift should look separately at energy efficiency, grid-connected renewable energy, and access to energy investments.

B. RISK AND INNOVATION

1. RISK APPETITE

321. **The GCF's strategies set the target to pursue higher risk-appetite levels than other funds, a willingness to pilot and pursue technological innovation, and a broad range of financing instruments. However, there is a discrepancy between the evident risk appetite and the stated risk appetite in the energy portfolio.**
322. The GCF's strategic plans uniformly stressed that the GCF will "take on risks that other funds/institutions are not able or willing to take, including risks associated with deploying innovative climate technologies" (Green Climate Fund, 2016), and will "exercise investment risk appetite and novel applications of GCF financial instruments to promote innovative, new and emerging technologies [and] demonstrate viability of innovative approaches" (Green Climate Fund, 2023d).
323. **The GCF has a limited risk appetite for more transformational and innovative energy technologies such as offshore wind, green hydrogen and energy storage, particularly in private sector projects.**
324. Although the GCF clearly identifies "testing and deploying innovative large-scale market-based financial instruments for breakthrough technology innovations" as an action in the pathway for paradigm shift (Green Climate Fund, 2022c), most private sector agencies claim that the GCF has a limited risk appetite for more transformational technologies. This is supported by the very small number of private sector projects including such emerging technologies.

325. The GCF has not been able to promote innovative products and technologies such as offshore wind, green hydrogen and energy storage, although private sector AEs have presented FPs including those technologies. This perception is corroborated in the IEU evaluation of the private sector, which mentions that the overall portfolio-level use of financial instruments provides an indication that the GCF is not targeting high-risk private sector investments (Independent Evaluation Unit, 2021). This may reflect the lack of technical expertise in the GCF Secretariat to properly assess innovative technologies and products. The GCF may, however, have been more innovative in the public sector, by transferring commercially established technologies to countries that have riskier financial/enabling environments.
326. **The GCF has contributed to project de-risking by providing a blend of financing instruments well suited to project requirements. However, the dominance of senior loans as a financial instrument for energy sector programming attests to a more risk-averse positioning.**
327. The GCF has been able to provide the right financing instruments for energy sector projects, such as guarantee mechanisms and contingent grants for risky energy development projects (for example, in the FP020 project for developing the potential for geothermal energy in the Eastern Caribbean). Other instruments, including grants, concessional loans and equity, are evidently useful, but it is the blending of instruments from the GCF and co-financiers that enables the most project de-risking.
328. An IEU evaluation of the Fund's approach to the private sector suggests that access to a diverse range of funding instruments helps to engage and mobilize private finance. Lessons from other international funding institutions and their use of funding instruments demonstrate the importance of flexible financing structures, the principle of "least concessionality", enhanced risk appetites and innovative blended finance (Independent Evaluation Unit, 2021). To date, senior loan is the dominant financial instrument in GCF's energy investment portfolio.
329. The analysis of APRs for energy projects indicates some, but limited, progress in financial, technical and managerial innovation. In many instances, innovativeness is merely described as "innovative measures", with little evidence of tangible changes or technology advance.

2. INNOVATIVENESS OF THE PROJECTS

330. **The conceptual definition of innovation has been very loose and subjective across funded projects and project implementation. The GCF does not track the innovation criterion in FPs but uses it in the interim evaluations of the project.**
331. According to most agencies, the GCF promotes innovative approaches by including very stringent criteria on additionality and innovation in its IAT for concept notes and FPs. However, there is no database compiling additionality and innovation assessment from those concept notes and FPs. The Secretariat and iTAP assess FPs against six investment criteria that the Board adopted as an initial framework for the GCF – namely, impact potential; paradigm shift potential; sustainable development potential; needs of the recipient; country ownership; and efficiency and effectiveness.
332. The sub-criterion "innovation" is one of the six sub-criteria that falls under the "paradigm shift" investment criterion. Innovation is an embedded component in the GCF finance strategy, given its risk appetite to fund techniques, business models, modal shifts, processes and/or financial innovation having potential to accelerate large-scale climate finance. For the purpose of the Investment Framework assessment, "innovation" is defined as the creation and/or adoption of new technical or business improvements. As defined in the GCF's *Investment Criteria Scorecard*, "technical innovation refers to the adoption of new or unproven technologies, new processes, or modal shifts in the context of reference", and "business innovation means novelty in business

models, financial instruments, organizational processes or their creation through unbundling and reassembling of existing ones” (Green Climate Fund, 2022a). The sub-criterion “application of best practices and degree of innovation” is one of the six sub-criteria falling under the “efficiency and effectiveness” investment criterion.

333. For the energy sector portfolio, iTAP provided an average score of 4.3 for the “paradigm-shift” criterion, and the Secretariat provided an average score of 4.5, which shows a high potential for energy sector projects to contribute to paradigm shift, and thus possibly innovation.
334. Still, since innovation only represents one of the six sub-criteria that falls under the “paradigm shift” and “efficiency and effectiveness” investment criteria, it is difficult to establish the direct correlation between the score of those two investment criteria and the score for the “innovation” sub-criterion.
335. The evaluation team conducted qualitative reviews of 26 APRs from energy projects and ranked financial, technical and managerial innovativeness lower than other criteria, with a rating of 2.54.³⁸ The evaluation also found that this aspect was frequently not mentioned directly in the APRs. Similar to the interim evaluations, if an APR enthusiastically mentioned innovativeness, it tended not to refer to actual innovative measures but served more as a catchword to describe prospects without implying profound changes. Awareness-raising is often categorized as a catalytic measure. As important as awareness is to enable any change, on its own it does not guarantee active steps towards results within the time frame planned for. The interim evaluation synthesis (see Volume II) questioned whether battery energy storage system (BESS) implementation could be categorized as innovative, when it was already in the process of being spread around the world in 2021. In the case of FP119, in Northern Gaza, new irrigation technologies and water control valves were newly introduced in the project area. There was no innovative technical or financial development in the global market, but introducing the technologies locally triggered a surge in results. In light of this, perhaps integration of long-existing technologies, financial products or business models should not be too eagerly underestimated as an innovative development, but rather should be recognized for triggering larger impacts. FP033 describes that working with several newer technologies, including BESS, has boosted Mauritian national confidence to the extent that the renewable energy target for the nation’s grid has been increased to 60 per cent, with particular emphasis on phasing out coal by 2030. Furthermore, FP033 is considered as one of the key contributors to the Government of Mauritius’s 60 per cent emissions reduction target.
336. The interim evaluations of 28 GCF energy projects (adaptation and mitigation) revealed that the overall scoring of the evaluation criterion “innovativeness (of financing/technical) in result areas” reached 3.23 out of 5. A score of 3 means “Moderately satisfactory (Typically not unsatisfactory but needing much more substance to be accepted as satisfactory)”, whereas a score of 4 suggests “Satisfactory (Typically convincing presentation but needing more evidence to support claims)”. These evaluations show that ongoing projects do not demonstrate a high score for innovativeness, but this may be due to the early stage of project implementation, meaning that projects have not had time to demonstrate fully the potential for innovation.
337. Although the GCF may not perceive this as being an innovative approach, one effective approach of “crowding in” energy investment would be to provide concessional finance to mitigate country and project risks where institutional capacity and regulatory frameworks, especially in SIDS and LDCs, cannot follow the pace of the growing opportunities in the energy sector.
338. Like the GCF, the GEF also claims to support innovative projects and approaches, and even claims that it takes investments to challenging frontiers. Since its creation, the GEF has aspired to be an

³⁸ The APRs were ranked from 0 to 5, with 0 marking ‘not discussed in the APR’ and 5 representing ‘highly satisfactory’.

innovative mechanism leading the way in the development of solutions that deliver global environmental benefits. The GCF and GEF-8 aim to bring about significant changes in various global systems, including energy and urban systems. Achieving such changes will require more innovation from both funds to find new ways of delivering global and impactful environmental benefits on a large scale. Investments in innovation are associated with higher risks than otherwise. Therefore, the GCF and GEF's commitment to transformational change will require taking more risks and being more innovative.

339. As mentioned in Table 6–1, the first pillar of the GEF climate change mitigation focal area is to “promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts” (GEF Secretariat, 2022). In line with this pillar, and to continue being a leader of innovation in the global environment finance space, the GEF launched an innovation window in GEF-8 for financing innovation with a higher risk tolerance. Recently, the role of the GEF Scientific and Technical Advisory Panel (STAP) has been expanded for this innovation window, in which STAP is expected to “help identify potential topics of investment that are relevant to the goals [of the innovations funding window]... the GEF will be working together with STAP and the GEF Council to examine the trade-offs of risk versus innovation, with an aim to establishing parameters for risk assessment, risk acceptance, and risk tolerance in programming” (GEF Secretariat, 2022). The GEF will use its innovations window to test and pilot new models, tools and solutions to global environmental problems, which will inherently require it to set guidelines to analyse the trade-offs of risk versus innovation. The GCF could consider creating a similar window to better analyse innovative projects and technologies.
340. **The GCF has access modalities to support innovative approaches and business models in the energy sector; however, they have not been well utilized to date.**
341. The SAP modality has the potential to support innovation by piloting and demonstrating approaches or ideas already developed in other markets and adapting them to different contexts and circumstances. However, it has not yet been used for this purpose.
342. At B.18, the Board requested the Secretariat “to develop terms of reference for a request for proposals to support climate technology incubators and accelerators”. Decision B.18/03 included several elements regarding the technical content of the request for proposals (RFP), based on document GCF/B.18/12, titled “Options for support for technology collaborative research and development”. Two examples of these elements include (i) support for collaborative research, development and demonstration in climate technology innovation systems, and (ii) targeting strategic actors and NDAs / focal points to collaborate with readiness delivery partners or AEs to submit proposals. This RFP modality also has the potential to drive innovation by providing support for collaborative research, development and demonstration in climate technology innovation systems in the energy sector, but the pilot RFP has not yet been launched.
343. The GCF's PSAA also has the potential to support innovation by supporting FPs submitted by entities not yet accredited to the GCF, especially potential/candidate DAEs and entities responding to RFPs, but the framework of the approach has not yet been fully operationalized to create a synergy with the SAP and RFPs.
344. **There are encouraging results in innovative business models and initiatives to promote energy savings in the renewable energy sector.**
345. The GCF has supported business models and delivery mechanisms in the energy sector such as energy services companies (ESCOs) that implement energy efficiency projects while guaranteeing energy savings, and energy savings insurance, which supports the expansion of the ESCO markets. However, the funding in ESCO market support is still limited. Since those business models are

highly dependent on the institutional and regulatory framework of each country, their use in a new country can be considered innovative. The ESCO model can be supported through both the DMA and the PSF.

- In FP028, MSME Business Loan Program for GHG Emission Reduction, in Mongolia, MSMEs are required to achieve a threshold amount of energy savings to access financing. This is believed to build the energy savings habit into practice among the MSMEs' stakeholders, while also changing loan officers' behaviours as they become more familiarized with green financing and technologies. In this case, innovativeness is seen as the ability to create a new norm in energy savings in business practices, and, potentially, in households.
- FP090, Tonga Renewable Energy Project under the Pacific Islands Renewable Energy Investment Program, laid the groundwork for broader renewable energy deployment in Tonga. It was also innovative in the sense that it enabled the private sector to generate renewable energy that can be stored in a government-owned and operated battery storage system, with Tonga Power as the off-taker. This demonstrates an innovative business model that the private sector can explore.
- FP099, the Climate Investor One project, involves the development and construction of 110 MW of commercial and industrial (C&I) rooftop solar power systems in Vietnam and Indonesia. Vietnam is a significant C&I market in South-East Asia, and Indonesia is in the early stages of adopting rooftop solar technology. This project aims to capitalize on the growing Vietnamese market to replicate a C&I business model³⁹ in Indonesia where good prospects are seen. It is hoped that a new C&I business model can be built in Indonesia by fostering the adoption of solar energy nationwide. Furthermore, Climate Investor One's investment brings expertise, employment opportunities and benefits to local communities through a community development programme.

³⁹ The C&I business model recognizes that the energy and operational needs of C&I entities differ significantly from those of residential or smaller-scale consumers. It is developed in such a way as to address the specific requirements and scale of C&I clients.

Chapter 8. MEASURING AND ACHIEVING RESULTS

KEY FINDINGS

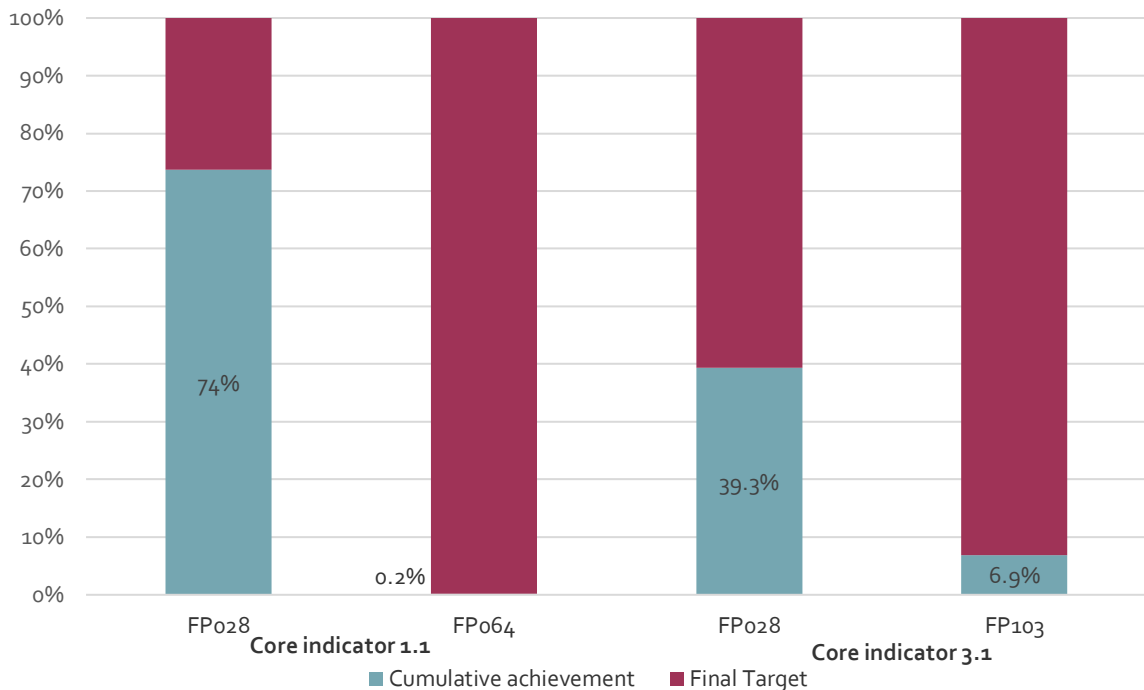
- There is limited alignment between RMF and IRMF indicators, while methodologies for calculating indicators lack consistency and harmonization, hampering tracking and managing results.
- There are inconsistencies in aggregating outcomes and impacts across GCF-funded projects and issues with the timeliness and availability of data.
- Most FPs outline good theories of change, but more than half of the projects lack the monitoring and reporting requirements, which may hinder the assessment of results at the end.
- Projected results of energy sector projects under the “Energy generation and access” results area are expected to reduce 2.04 billion tCO₂ emissions over their lifetime and reach 172 million direct and indirect beneficiaries. Such projected results remain unverifiable throughout the implementation and at the end of a project, as they are based on self-reported data and no quality assurance is undertaken.
- Most of projects are still in early stages of implementation, but there are early indications of forthcoming results, as observed in country case studies.
- The GCF has planned to achieve three to four times financial leverage in energy projects led by IAEs and regional DAEs, much greater than for national DAEs.
- The GCF has been able to plan to leverage funds from all multilateral/bilateral banks, as well as IAEs and regional DAEs, but at a lower ratio than other climate funds. Realized co-finance is slow to materialize.

A. MONITORING AND REPORTING

346. **There is limited alignment between RMF and IRMF indicators, while methodologies for calculating indicators lack consistency and harmonization, hampering tracking and managing results.**
347. The result management of the portfolio is hindered by a lack of reporting at the portfolio level. IRMF core indicators on energy data collected are scarce, and methodologies seem to vary, so assessing results are limited at this point of implementation. Interviews found that core energy indicators are not yet consistently understood, applied and reported by AEs. The Division of Portfolio Management is taking an exercise to retrofit old Portfolio Management System energy indicators to the IRMF core indicators related to “Energy generation and access”, “Energy efficiency” and “Transport”, where possible, to harmonize reporting. However, full alignment with IRMF indicators for all energy projects has not been possible up to this point.
348. In FP and SAP proposal documents, indicators are calculated by the AEs, using methodologies from the GCF methodological framework and the IRMF (Green Climate Fund, 2021a). The main indicators are GHG emissions reductions and number of beneficiaries. Additional indicators specific to energy projects are MW of installed capacity for renewable energy, annual energy savings in megawatt-hour equivalent (MWh), installed energy storage capacity in MWh, improved low-emission vehicle fuel economy in volume of fuel per km travelled, as well as total investment for green transport and mobility, renewable energy and energy efficiency projects. Qualitative information on policies supports the tracking of project performance.
349. The methodology to determine the indicators is defined in the *Integrated Results Management Framework: Results Handbook* (Green Climate Fund, 2022b). For some indicators, the guidance of the GCF leads to easily verified results. For others, such as annual energy savings, which are determined using international protocols such as Clean Development Mechanism or the International Performance Measurement and Verification Protocol, the calculations are complex since savings often depend on independent variables (weather, operating hours, occupancy, etc.) that change with time. Hence, the results can vary importantly depending on the hypothesis and methodology used.
350. Also, there is a lack of alignment between the targets of the GCF’s Strategic Plan for the 2024–2027 period (e.g. the number of countries to receive support within the energy sector) and the current IRMF, which has no concrete targets for monitoring emissions reductions by energy projects and plans to integrate these targets. Similarly, “hard-to-reach” developing countries and addressing “hard-to-abate” sectors, the progress tracking towards these objectives remains uncertain.
351. Other challenges relate to setting realistic targets. An illustrative case is India’s FP081 project installations, which were expected to generate around 4,000 direct jobs and lifetime mitigation of 8.2 million tCO₂e. The mitigation targets are lower than expected at project design despite achieving target MW capacity, primarily due to lower than expected generation from rooftop plants, which has in turn required increasing the targeted installed capacity by 15 per cent.
352. Such shortcomings are detrimental to the tracking and management of results at both the project and portfolio levels and can limit the GCF’s ability to assess the impact and efficiency of its energy investments in mitigating climate change.
353. **There are inconsistencies in aggregating outcomes and impacts across GCF-funded projects and issues with the timeliness and availability of data.**

354. Aggregating data at the portfolio level was not possible as data on indicators for the most part are not available. Another recurring challenge with monitoring was the incompleteness of the portfolio data. The data regarding impact and project indicators is not consistently reported. Only a few projects have the complete set of baseline, targets and progress-to-date information reported promptly. Interim evaluations reviewed for this evaluation revealed that impact potential was low and varied across projects. Most impact potentials were reported in different financing approaches, technology transfer, low-carbon energy adoption, market transformation and improved energy access, and the impact potential was contingent to a number of variables and enabling environments. Only a few projects have the complete set of baseline data, targets and progress-to-date information reported promptly.
355. We analysed a sample of 18 projects for which consistent data on the core indicators 1.1 and 1.3, "share of tCO₂e reduced," were available for two results areas (energy generation and access, and building, cities, and industries). The entire sample is progressing towards their targets at a rate of 22–24 per cent (cumulative 2019-2022). Within this sample, we further reviewed five projects that are in the final disbursement phase, and four projects were only possible to analyse with available APRs and interim evaluations. As Figure 8–1 shows, progress is uneven, with two projects showing promise and the other two performing quite poorly. However, this sample size is small and thus not fully representative of the energy portfolio, and the data provided is self-reported and not validated by the IEU.

Figure 8–1. Achievement status for the core indicators 1.1. and 3.1 for four projects



Source: 2019-2022 APRs analysed by Datalab.

Notes: Core indicator 1.1: Share of tonnes of tCO₂e reduced or avoided as a result of increase low-emission energy access and power generation

Core indicator 3.1: Share of tonnes of tCO₂e reduced or avoided as a result of building, cities and industries and appliances

356. **Most FPs outline good theories of change, but more than half of the projects lack the monitoring and reporting requirements, which may hinder the assessment of results at the end.**
357. The IEU evaluability study⁴⁰ assesses the quality of the GCF's funded project proposals and assesses to what extent the approved projects are likely to inform the results they claim in a credible and measured manner. The assessment uses four lenses (the theory of change; potential to measure and report causal change; implementation fidelity and performance against investment criteria; and data collection and reporting credibility) to assess the potential for internal validity of FPs. Based on the stoplight assessment framework, the team assessed the GCF's energy-related projects versus non-energy-related ones.
358. Reflecting on the theory of change, the study found that 82 per cent of energy-related projects have a well-articulated theory of change or a logic framework / theory of change is present but needs some clarification (rated low risks or medium risks), compared to 82 per cent of the non-energy related projects. On the other hand, 37 per cent of energy-related projects are rated as high risks, as their unintended consequences are neither identified nor discussed anywhere in the theory of change, although they are potentially substantial given the project design.
359. The team also assessed the potential ability of the energy-related projects to credibly measure and report causal change. For 56 per cent of the energy-related projects, the requirements for monitoring and evaluation are not specified or cannot be determined from the information provided in the proposals; this figure was 36 per cent for the non-energy-related projects. Overall, for more than half of the energy-related projects, the GCF will not be able to determine whether causal change can be attributed to its investment in a credible manner.
360. **Projected results of energy sector projects under the “Energy generation and access” results area are expected to reduce 2.04 billion tCO₂ emissions over their lifetime and reach 172 million direct and indirect beneficiaries. Such projected results remain unverifiable throughout the implementation and at the end of a project, as they are based on self-reported data and no quality assurance is undertaken.**
361. As mentioned earlier, the evidence of outcomes from APRs is quite limited for evaluating the progress of projects against their targets. Also, the long-term nature of impact makes it difficult to assess when the majority of projects are still in the first disbursement phase; so far, 10 energy projects are fully disbursed and data on the indicators' progress on these projects are not complete. Relatively few projects are reporting significant actual achievements of GHG emissions reductions or impact of adaptation on beneficiaries' resilience. Energy sector projects addressing mitigation and adaptation under the “Energy generation and access” results area are expected to reduce 2.04 billion tCO₂ emissions over their lifetime and reach 172 million beneficiaries. The number of beneficiaries goes up to 249 million when looking at energy sector projects under a sectoral guide approach. The review of the iTAP and Secretariat ratings on climate impact potential for FPs found that energy projects are rated higher than the rest of the GCF's projects.
362. According to the latest available aggregate numbers on climate impact calculated by DataLab, the 55 projects with adaptation components benefited 117,501,436 direct beneficiaries. These results could not be validated by the IEU due to the limitations of self-reported data.
363. Several potential high-impact CO₂ emission reductions projects stand out. China's FP082 project aims to reduce emissions by 50 million tons, equivalent to approximately 0.4 per cent of China's annual CO₂ emissions in 2021, with a GCF budget of USD 100 million. India's FP164 project

⁴⁰ Not yet published.

targets a reduction of 166 million tCO₂e, constituting a 6.13 per cent decrease from India's 2021 emissions, with a GCF budget of USD 137 million. Meanwhile, Indonesia's FP083 project plans to mitigate 112.3 million tCO₂e, translating to a 0.18 per cent decrease from Indonesia's 2021 CO₂ emissions, with a total GCF project budget of USD 310 million.

364. **Most of projects are still in early stages of implementation but there are early indications of forthcoming results observed in country case studies.**
365. Data collected from country case studies points towards a low implementation rate across all projects in the countries visited but with some promising results for some of the projects. For example, Chile's FP017 project is moving towards its CO₂ target, and Tonga's investment has led to market transformation. North Macedonia is progressing well towards implementing readiness projects to strengthen the institutional framework and the country's energy sector sustainability. In some other cases, like in Zambia, low implementation is faced, with challenges related to access, tailored solutions, and low bankability of projects. Indonesia's GCF implementation rate is slow due to project modifications and complex planning, and Mongolia faces specific challenges related to the country's regulatory framework in energy sector.

Box 8–1. NDC analysis

DataLab conducted an analysis of countries' sum of per year average GHG emissions (over the project lifespan) of all GCF energy mitigation projects in each country versus each country's NDC mitigation goal for 2030. Existing evidence shows that GCF energy projects are unable to substantially help achieve the 2030 GHG mitigation goal in mostly emerging market countries with a fast-growing population, whereas GCF energy projects could substantially cover the NDC GHG mitigation goal for many SIDSs (see Volume II for further details).

Source: NDC partnership data and DataLab analysis.

B. CO-FINANCING

366. **The GCF has planned to achieve three to four times financial leverage in energy projects led by IAEs and regional DAEs, much greater than for national DAEs.**
367. The GCF does not require a specific co-financing ratio from AEs,⁴¹ but still expects a certain level of co-financing from IAEs to ensure they have some "skin in the game". When looking at the leverage per type of AE shown in Table 8–1, we can observe that IAEs plan to contribute three times more than national DAEs and twice as much as regional DAEs, on average, at individual project level, and nine times more than national DAEs in terms of total amount invested.
368. The GCF has traditionally been good at leveraging co-financing from partner organizations and states. The GCF was able to leverage four times its own investment in energy projects led by IAEs and almost three times as much for regional DAEs. The situation is very different for energy projects led by national DAEs, which operate in smaller and more fragile states, where projects are likely to have larger gaps to commercial viability and, consequently, less ability to leverage funding other than grant finance.

⁴¹ According to the Investment Framework approved at B.37, "the Fund does not require any minimum amount of co-financing for a Funded Activity".

Table 8–1. Co-financing ratio: based on the approved amount for GCF funding over the total approved, filtered by energy sector project, by region and by AE type

	ENERGY PROJECTS	REGIONS					AEs		
		Africa	Asia-Pacific	LAC	Eastern Europe	Multi region	IAEs	National DAEs	Regional DAEs
Min	0.01	0.01	0.19	0.13	0.87	0.36	0.04	0.01	0.27
Max	17.23	5.78	13.02	17.23	6.07	8.72	17.23	4.40	5.90
Median	1.64	1.09	1.58	1.00	4.80	4.58	2.58	0.93	1.00
Average	2.70	1.86	3.05	2.31	3.91	4.23	3.21	1.00	1.82
Count	105	34	31	22	3	15	76	16	13
Overall							4.04	0.78	2.86
Total amount by GCF in USD million	8,323	2,103	2,329	1,397	47	2,445	6,628	716	979
Total co-financing amount in USD million	30,126	5,132	10,554	3,978	210	10,252	26,765	559	2,802

Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

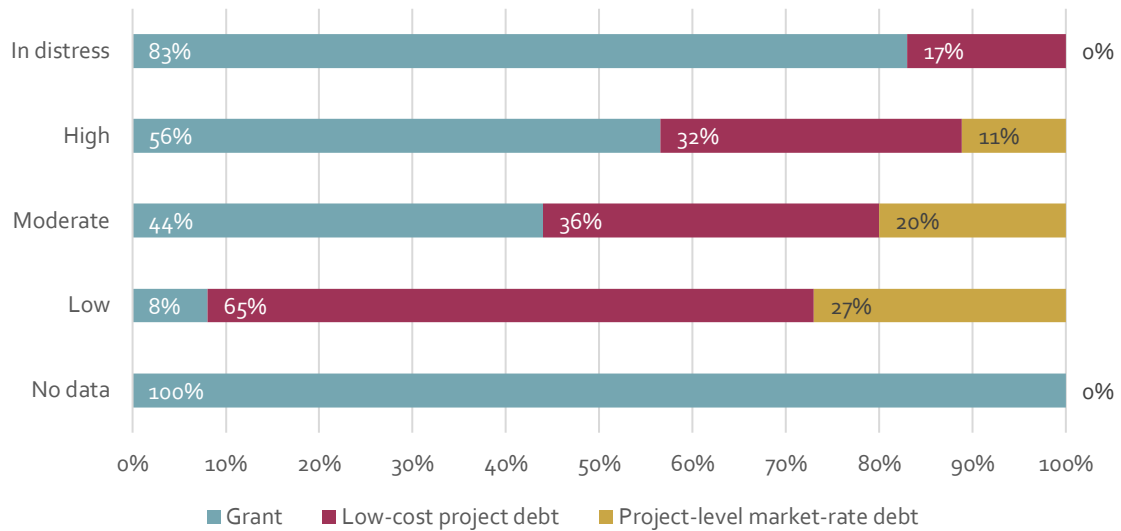
Note: LAC = Latin America and the Caribbean.

369. **The GCF has been able to leverage funds from all multilateral/bilateral banks but at a lower ratio than other climate funds.**

370. Until GCF-1, all projects benefited from some co-financing. IAEs contribute three times more in planned co-financing than national DAEs and twice as much as regional DAEs, on average, as shown in Table 8–1. The median co-financing ratio for the overall energy sector portfolio implemented by IAEs is 1:2.58, and the average is 1:3.21, which are both lower than the ratios for the GEF and the CIF. In comparison, the GEF has set an objective for the overall project portfolio (not only the energy sector) to achieve a co-financing ratio (inclusive of in-kind contribution) of at least 7:1, and of 5:1 for projects in upper-middle-income countries and high-income countries that are not SIDS or LDCs. In its annual report for 2022, the CIF was expecting a co-financing ratio of 1:8.6 for the overall portfolio. When looking at specific energy sector programmes, the ratios vary greatly. The CTF, which finances a high proportion of energy sector projects, was expecting a co-financing ratio of 1:11, and the SREP was expecting a co-financing ratio of 1:5.6 (Climate Investment Funds, 2023).

371. These findings are also supported by analysis of the CPI (Buchner and others, 2023), which indicates that markets in financial distress (i.e. high levels of national debt) absorb primarily grant-based instruments and have difficulty leveraging co-financing (as shown in Figure 8–2). As these countries improve financially, they can attract more co-financing (both concessional and market-rated).

Figure 8–2. Share of climate finance instruments, by debt distress level (2021)

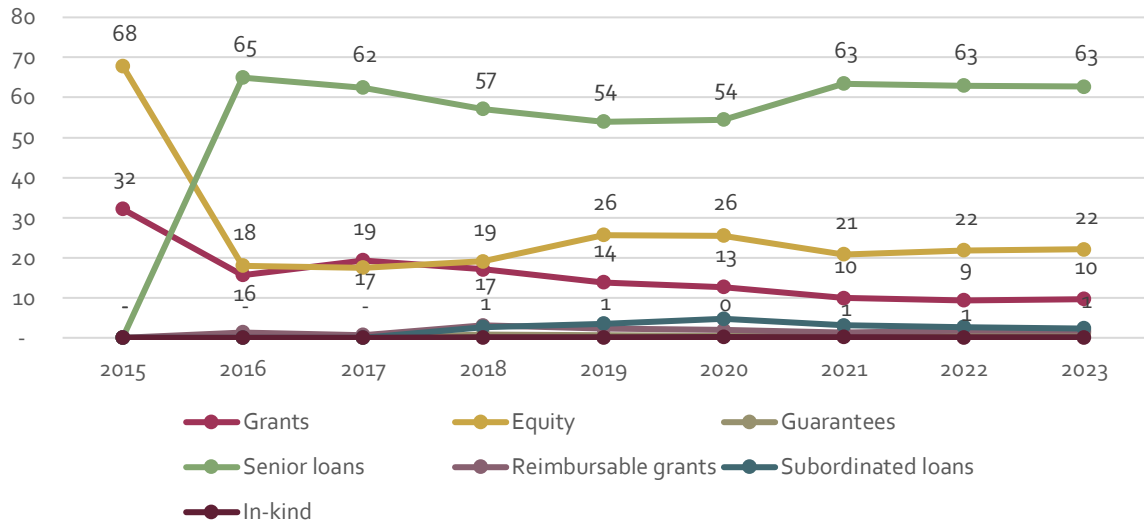


Source: Buchner and others (2023). Available at <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2023/>. Copyright © 2023 Climate Policy Initiative. All rights reserved, under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) Licence.

372. The Second Performance Review reported that co-financing is materializing at a relatively slow pace. The Secretariat has acknowledged the issue. The 2021 annual portfolio performance (GCF/B.34/Inf.11/Rev.01) states that “the failure to realize projected co-financing or delays in the timelines for co-financing is increasingly being experienced among projects. Reasons for this vary and include the fact that in many cases, co-financing presented at the design stage is indicative or proposed and does not represent confirmed commitments.”
373. Private sector led GCF energy projects have higher average co-financing ratios (1:3.1) compared to public sector energy projects (1:2.6), which is a result of their distinct needs and the modalities and risk profiles within which they operate, which limits the ability of public sector projects to achieve high leverage.
374. Private sector energy projects approved more recently have more funding instruments than a few years ago. However, most of the volume of finance is made up of senior loans: 53 per cent of the total projects budget is implemented under the PSF, followed by equity at 36 per cent and subordinated loans and grants at 2 per cent. The bulk of the projects have deployed low-risk capital for mitigation projects to on-lend at smaller scale to private sector MSME beneficiaries, supporting financial institutions and banks through senior loans but also increasing equity investment in GCF-1. A high number of projects invested in energy access and generation are deployed through senior loans, followed by equity and subordinated loans.
375. The evidence collected indicates that energy project loans (Figure 8–3) have been mostly AE driven, low-risk, and suitable for projects with revenue streams. For grants, their slow deployment could be related to the GCF’s use of them for specific and complex projects, which might not always be the case for energy-related PSF projects. Also, the GCF has not yet solved the issue of guarantees, as it does not have a credit rating appraisal function. There has been recent progress with the newly accredited CARICOM Development Fund, the first regional DAE that will issue guarantees in the Caribbean for private sector energy efficiency / renewable energy projects. PSF energy projects

mainly invested in grids (off-grid/mini-grid) and renewable energy (solar PV), followed by energy access and energy efficiency standards and renewable energy (solar power plants and wind energy).

Figure 8–3. Evolution of energy project total investments, by financial instrument



Source: Tableau server iPMS data, as of B.37 (23 October 2023), analysed by the IEU DataLab.

Note: The data used in this figure are total GCF support of GCF projects with energy components.

Chapter 9. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

Relevance

376. **Conclusion 1.** As a key operating entity under the financial mechanism of the UNFCCC, the GCF has a prominent position in the climate finance landscape through its reach, size, partners, legitimacy and modalities. However, the GCF's goals and intended pathways in catalysing a paradigm shift in the global energy sector seem less clearly articulated. For instance, the portfolio lacks intentionality for achieving a global energy transition, and its passively articulated strategic positioning translates into limited alignment across frameworks and guidance for project development.
- **The evaluation finds that the GCF programming and operations generally align with UNFCCC principles.** The new *Strategic Plan for the Green Climate Fund 2024–2027* emphasizes the GCF's role in a just transition. However, the GCF has yet to take initial steps to integrate just transition principles into its energy sector approach.
 - **The GCF has many comparative advantages as a fund dedicated to climate action.** These include the size of its interventions and its coverage, diversity of instruments, risk appetite and legitimacy as a United Nations fund. Although the GCF is primarily seen as a finance provider, its position and priorities in the energy sector are less visible to partners.
 - **Consequently, the portfolio does not actively seek synergies beyond project-level impacts. Further, the GCF does not have a strategically integrated approach to energy investment between supply-side and demand-side measures or across energy subsectors at the portfolio level.** The Fund is in the process of contributing extensively and effectively to the deployment of renewable energy generation. However, it is underfinancing energy efficiency compared to its potential for GHG abatement. Evidence also suggests that the GCF does not significantly prioritize energy storage, transmission and distribution at scale or emphasize new or “emerging” energy sources. For example, the GCF could consider coupling supply-side and demand-side approaches to increase energy reliability and reduce vulnerability to climate change. Coupling is especially important for energy access projects where the supply side is fully decarbonized but the demand side still uses inefficient equipment and appliances that hinder a complete transition. This balanced approach is not evident in GCF energy sector investments to date.
 - **From an energy sector perspective, project development and applying frameworks and tools for project development are not standardized and mainstreamed.** The limited alignment between concept note development, investment decisions and results management creates challenges for country partners and implementing entities. Two important frameworks exemplify this dissonance: (i) the sectoral guidance that provides information on how targeted GCF investments aligned with country priorities could achieve optimal impact for identified sectors and subsectors, and (ii) the results areas defined by the IRMF for results management of adaptation and mitigation projects/programmes.

- Sector-specific guidance is mainly contained in 10 sectoral guides provided by the GCF Secretariat. While these 10 guides may support project origination and development, the evaluation could not find evidence of their systematic use among stakeholders or that they resulted in high-quality and impactful FPs for the GCF Board's consideration. The set of sector guides addresses several aspects of the energy sector but is not comprehensive enough to include newer subsectors, technologies or impact areas. Also, as they are not widely known within the GCF ecosystem and among energy sector stakeholders, their utility as reference documents is inconsistent. The sectoral guides' limitations have led to energy-related GCF-funded activities being incorrectly classified and a lack of standardization and systematic cross-referencing in mapping GCF projects.
- **As per the guidance in the IRMF, GCF-funded projects in the energy sector are not always classified under climate change adaptation, presenting a missed opportunity to accurately manage or measure activity results.** The GCF does not comprehensively define the concept of adaptation in energy projects, as most frameworks and sector guidance fail to mention it. The only GCF-funded projects that clearly identify adaptation are those that include energy access. While energy efficiency and energy generation projects could provide solutions to climate change adaptation and resilience challenges in countries, they are not explicitly considered adaptation projects. This challenge particularly applies to the energy portfolio in vulnerable countries, such as SIDS, LDCs and African States.

Energy sector programming

377. **Conclusion 2. While the GCF's programming in the energy sector shows substantial volume, reach and use of a diverse set of financial instruments, the Fund has yet to identify and engage the right actors to support achieving strategic and coordinated programming at the country, regional and global levels. NDAs lack the necessary power to convene public and private entities in the energy sector, and the GCF has missed some opportunities to optimize dedicated support to countries. Co-benefits, in particular gender considerations, in the GCF-funded activities in the energy sector are insufficiently addressed for gender transformation and are limited to commentary on the process identified in gender action plans.**
- **From the overall portfolio perspective, the GCF's use of diverse financial instruments is unmatched by other comparable agencies and funds.** The GCF portfolio includes large volumes of debt and reimbursable financing at highly concessional rates, which have helped with the financial flows in developing countries, strengthening financial systems and scaling green loans. To a limited extent, the PSF portfolio comprises a mix of financial instruments and grants, particularly equity and grants. Such an approach is often particularly useful for not yet commercially viable investments that focus on establishing markets, supporting ecosystems and identifying a specific development impact. So far, the GCF's PSF seems to limit such approaches to projects in the energy access subsector.
 - **Country ownership has been found to be a key prerequisite for successful GCF programming, in particular in the energy sector.** Based on the engagement with country stakeholders, the evaluation identified three main drivers for country ownership: (i) leadership of the country in the strategic processes for identifying projects, aligned with national strategies across government ministries, (ii) institutional capacity to plan and manage climate activities and investments, and (iii) countries, entities and the GCF share a common vision about best practices in planning and delivering climate action. The GCF has developed an extensive regional and country coverage through its network of 54 AEs and 148 NDAs working with

GCF-funded projects with relevance to the energy sector. It can support energy sector projects in countries with less access to international climate finance, including in SIDS, where the small size of markets makes them unattractive for investors looking to deploy funding at scale.

- **While the GCF project origination for energy projects is country driven, GCF programming is hindered by the inefficiencies of the NDA-driven model related to coordinating, engaging and mobilizing energy sector stakeholders.** In most cases, NDAs and focal points work under the auspices of a government ministry, such as the Ministry of Finance or the Ministry of Environment. Such institutional arrangements often pose coordination challenges with the energy ministries. Common structural and institutional challenges include a lack of institutional authority, inadequate technical expertise, political affiliations and alignment between ministries regarding the planning processes in the energy sector. In practice, country ownership is operationalized via the NDA and/or focal point. The NDA or focal point's position has been identified as a key driver in ensuring alignment between GCF-funded projects/programmes and country energy transition strategies. The evaluation found broader alignment with the countries' NDCs and, where available, their national energy sector strategies and plans. In contrast, alignment with country priorities has been more challenging in multi-country projects at the regional and global levels.
- In the energy sector, the evaluation team found challenges with coherence and complementarity at the country level. Country partners, entities and the GCF often lack a common vision. In the GCF, country ownership is driven by the NDA and focal points. Consequently, the evaluation finds limitations in effectively engaging various stakeholders – particularly the private sector – in national, regional and global energy sectors. So far, most projects in the energy sector are implemented by IAEs or local financial institutions. NDAs find it challenging to meaningfully convene commercial-type private sector DAEs and engage with prominent actors in the wider energy sector. The evaluation observed that although the GCF has potentially extensive regional and country coverage, the energy sector faces limitations in accessing finance due to the limited use of national and regional DAEs on the one hand and limited use of the RPSP on the other. This is particularly important for vulnerable countries, such as SIDS, where IAEs looking for funding at scale may deem a small project proposal unattractive and unprofitable. The evaluation found that ensuring future project diversity and private sector involvement in the GCF's energy portfolio will become difficult if such a trend continues. Thus, the energy portfolio may not be able to contribute meaningfully to the institutional targets of the GCF.
- **GCF energy projects have paid increasing attention to mainstreaming gender and Indigenous Peoples since the GCF established the respective policies in 2019.** However, action plans for energy projects only partly address women's inclusion in the energy value chain. Gender action plans are not always scoped to or integrated with the main results frameworks of projects. They tend to focus on women's participation in project activities but not necessarily on their full potential role as stakeholders and entrepreneurs. Therefore, the portfolio is not yet gender transformative. It is estimated that 37 per cent of all GCF projects have a potential impact on Indigenous Peoples, and 50 per cent of energy projects target Indigenous Peoples. Few energy projects addressing Indigenous Peoples showed results at the community level, such as the participation of Indigenous Peoples in project implementation.

Enabling environment for the energy sector

378. **Conclusion 3. An enabling environment is critical for the success of climate investments, projects/programmes and, ultimately, wider transformation in the energy sector. While GCF**

frameworks, policies and strategies have identified the importance of an enabling environment for programming, it remains underemphasized in the implementation of the GCF's readiness and preparatory support and GCF-funded projects and programmes.

- **Readiness and preparatory support grants can provide greater support for an enabling environment at the country and regional levels in the energy sector.** This support is, however, underutilized. Enabling environment principles include strong, transparent legal and regulatory frameworks, especially to align policy frameworks between the country, regional and subregional levels; strong regulatory institutions; creditworthy off-takers in the energy sector; cost-reflective retail tariff structures; technical and commercial efficiency in the local energy sector; procurement processes; and strategic and integrated energy sector planning. Readiness is not yet fully utilized to assist capacity-building for the energy sector; remedying this will help ensure more coherent and systematic institutional support at the country level.
- **Project appraisal processes do not strongly emphasize or reinforce project components related to the enabling environment within FPs.** The GCF does not have a systematic approach to promoting activities for creating enabling environments, which limits the incentive to support projects focused on establishing an enabling environment for energy sector projects. This could constrain stakeholders' capacity to undertake sector reforms that would support a paradigm shift. Unlike the GEF and MDBs, the GCF considers that the following project activity types do not deliver additionality: "project activity enables resource mobilization", "project activity enables regulatory change" and "project activity promotes adoption of higher environmental and social standards" (Green Climate Fund, 2022e). This limits the incentive to support projects that establish an enabling environment for energy sector projects. The GEF and MDBs place greater emphasis (both in financial volume and type of activities) than the GCF on supporting energy sector governance, which is critical for properly integrating new energy technologies or sources in a market.

Risk and innovation

379. **Conclusion 4. Given the high potential and level of development in the global energy sector, an adequate approach to risk management by the Fund is key for GCF programming. Risk is, however, limited in the GCF energy portfolio. Limited operationalization of a risk framework and an observed mismatch between actual and stated risk appetite presents a challenge for GCF programming in the energy sector. Lack of clarity around concepts for innovation and paradigm shift hinders the effectiveness of GCF-funded activities.**

- **The GCF's comparative advantage lies in programming at scale, leveraging broad partnerships and willingness to programme with a higher risk appetite, particularly for the advanced global energy market.** While the mandate provides for such programming, the GCF has yet to fully utilize its potential to support riskier energy sector projects. The *Initial Strategic Plan for the GCF* (2016) identified the need for the GCF to "build on its comparative advantages and operate in coherence with the existing climate finance institutions". At that time, the GCF's competitive advantages included programming and financing at scale, including leveraging additional finance from innovative and alternative sources and partnerships with public and private actors at different levels. The advantages also included higher risk-appetite levels than other funds, a willingness to pilot and pursue technological innovation, and a broad range of financing instruments. These advantages continue to be of particular relevance to the global energy transition. With the paper *GCF: Catalysing finance for climate solutions* (Green Climate Fund, 2023b), the GCF also identifies four key systemic

transitions for GCF support – low-carbon energy for all, climate-resilient infrastructure, sustainable and secure food systems, and protection of ecosystems and biodiversity – alongside the following transformative objectives: enabling environment, de-risking investment, accelerating innovation and aligning finance with sustainable development. The current GCF energy portfolio does not fully align with this position. Although the GCF does not have specific cost-effectiveness targets, the GCF energy sector portfolio shows comparable values to those achieved by MDBs and other climate funds. In some energy subsectors, the Fund has room to focus less on cost-effectiveness, allowing it to consider engaging in riskier energy projects.

- **To date, the GCF's energy sector portfolio demonstrates a limited risk appetite for more transformational and innovative energy technologies such as offshore wind, green hydrogen and energy storage. The dominance of senior loans as a financial instrument for energy sector programming attests to a more risk-averse positioning.** Although the GCF clearly identifies “testing and deploying innovative large-scale market-based financial instruments for breakthrough technology innovations” as an action in the pathway for a paradigm shift (Green Climate Fund, 2022c), most entity and country stakeholders perceive the GCF as one of the climate funds with a limited risk appetite for more transformational technologies. Different divisions within the Fund demonstrate varying degrees of risk appetite. There is a discrepancy between the evident risk appetite and the stated risk appetite in the energy portfolio. The risk appetite for energy projects does not reflect the GCF's intentions in the energy sector.
- **GCF support for certain energy projects can potentially generate a paradigm shift in the energy sector. However, paradigm shift is poorly tracked in energy sector projects.** GCF projects show promising signs of market transformation for solar energy by creating enabling conditions for market-driven delivery at scale. Other projects include setting up institutional arrangements for renewable energy generation, transmission and distribution; scalability in green financing; and shifting to renewable energy at a large scale. However, paradigm shift potential (stated in FPs) lacks the level of detail necessary for its assessment in APRs due to the lack of defined criteria/metrics for measuring paradigm shift in project proposals.
- **The GCF has not clearly defined its expectations for innovation in the energy sector, although it has the access modalities to support innovative approaches and business models. The GCF has been somewhat innovative in using the right financing instruments and delivery mechanisms, but results to date are limited.** The conceptual definition of innovation has been very loose and subjective across funded projects and project implementation. Often, it is used as a catchphrase without supporting information. Although still not formally defined, innovation may include, among others, untested technology, a well-established technology that is new to a particular market, or financial products and business models integrated innovatively. The GCF has contributed to project de-risking by providing a blend of financing instruments well suited to project requirements. The SAP has not been fully utilized, despite its potential to support innovation by piloting and demonstrating approaches developed in other markets and adapting them to different contexts. The RFP modality to support climate technology incubators and accelerators has the potential to drive innovation by supporting collaborative research, development and demonstration in climate technology innovation systems in the energy sector, but the pilot RFP has not been launched yet.

Measuring and achieving results

380. **Conclusion 5.** Generally, the results management has been underdeveloped to serve the Fund's needs to identify and demonstrate results. The results management of the GCF's investment portfolio continues to face legacy challenges. These challenges include poor quality at entry, limited GCF project/programme progress reporting and conceptual gaps in measuring the effectiveness of investments at the portfolio and project levels. Tracking of the GCF's strategic targets is yet to be integrated.
- **Most GCF projects are still at an early stage of implementation. Consequently, climate impacts are modest across the entire energy portfolio, but there are early indications that results are forthcoming.** Assessment in this evaluation report is based mainly on annual reporting (in APRs) on the expected impacts of GCF-funded projects, based on the logframes of the individual FP packages. The GCF still struggles with inconsistencies in aggregating outcomes and impacts across GCF-funded projects. Nevertheless, the set of reviewed interim evaluations revealed that impact potential was low and varied across projects. Most impact potentials were reported in different financing approaches, technology transfer, low-carbon energy adoption, market transformation and improved energy access. The sample of five GCF-funded projects with completed interim evaluations did not reflect the overall trends in the global energy sector and the GCF energy portfolio. Thus, the sample is not fit to propose an early overall portfolio-level impact. Another recurring challenge was the incompleteness of the portfolio data. The data regarding impact and project indicators are not consistently reported. Only a few projects have the complete set of baseline data, targets and progress-to-date information reported promptly.
 - **The limited alignment between the Investment Framework and the IRMF systematically limits assessment of the effectiveness, outcomes and sustainability of the energy sector portfolio of the GCF. Inconsistency and a lack of unity of metrics and methodologies for measuring paradigm shift at the project level present an additional challenge for results management.** Projects reviewed by the evaluation team showed inconsistent metrics and methodologies for measuring the paradigm shift of energy projects. Data on impact and project-level indicators are incomplete and not credible due to known limitations of self-reported information. So far, the results management system does not aggregate or report results at the energy sector portfolio level. Data are only partially reported in APRs. Also, an IEU assessment of the evaluability of GCF-funded projects found gaps and limited quality at entry in Board-approved FPs. The assessment shows that monitoring and evaluation preparation of GCF energy projects remains weak – for example, in causal pathways, measurement, data collection and implementation fidelity.
 - **Co-benefits are systematically underemphasized. The definition of co-benefits is not sufficiently comprehensive, nor are the results attributed and disaggregated for different beneficiary groups. While some projects of the GCF energy portfolio identify a limited set of co-benefits and track their results, several relevant co-benefits for energy sector projects are neither identified nor tracked.** The co-benefits currently observed in the GCF's energy sector portfolio include water access and sanitation, infrastructure resilience, and crop and food security. However, typical and relevant social, economic and environmental co-benefits, such as green jobs/employment, improved health, livelihoods or education considerations, are not identified or tracked at the project and portfolio levels. This limited understanding and tracking of potential co-benefits presents a missed opportunity for measurement of impact as well as a challenge for adaptive management. First, the extent to

which these co-benefits accrue to women, youth, Indigenous Peoples and other potentially vulnerable groups is not tracked or reported. This is a missed opportunity to observe the wider impacts of GCF-funded projects and the economic and social performance of the Fund. Secondly, observing co-benefits supports the Fund's efforts to create sustainable investments and actions in a particular context. Observing indicators that could help identify early unintended consequences of GCF-funded activities is crucial, as it provides an opportunity for adaptive management of GCF projects/programmes. Lastly, evidence on the integration of the principles of just transition is lacking. The operationalization and monitoring of just transition have yet to be defined.

- **The GCF lacks specific emissions reduction targets for the energy sector, which will hamper the ability to monitor impact in the future.** The GCF's *Strategic Plan for the Green Climate Fund 2024–2027* establishes specific targets for the number of countries to receive support within the energy sector. Yet, in the current IRMF, there are no concrete targets for monitoring emissions reductions by energy projects or plans to integrate these targets. Similarly, while there is a heightened focus in the strategic plan on assisting “hard-to-reach” developing countries and addressing “hard-to-abate” sectors, the progress tracking towards these objectives remains uncertain. These shortcomings can limit the GCF's ability to assess the impact and efficiency of its energy investments in mitigating climate change.

B. RECOMMENDATIONS

381. **Recommendation 1. The evaluation recommends that the GCF clarify the pathways for a paradigm shift in the energy sector and its intended role. Providing such clarity would include (i) considering the increased complexity of climate projects, (ii) increasing emphasis on energy efficiency, (iii) linking demand and supply in energy generation, and (iv) considering new and innovative technologies and approaches for piloting and scaling projects.**

1.1. As a key global actor and the major multilateral climate fund, the GCF should clarify its position and intention in the energy sector. It should describe its expected paradigm-shifting pathways for the energy sector more explicitly, setting out relative priorities for programming across subsectors and providing clearer guidance to stakeholders. The results framework should, in turn, lead to a more coherent approach to project classification. The GCF should consider identifying its intended role in the global energy market, based on which it could define intended portfolio results, which can inform the design of individual projects and readiness support.

1.2. This evaluation recommends that the GCF consider a paradigm shift in the energy sector through comprehensive approaches, ensuring that renewable energy generation projects are consistently complemented with grid integration and storage and that demand-side measures, including energy efficiency, receive increased investment. Renewable energy generation projects should be more consistently complemented with grid integration and storage. Renewable energy generation is generally intermittent (wind, solar PV, solar thermal, tidal, etc.). So, to ensure a 100 per cent renewable energy supply, large-scale storage systems, adapted and integrated transmission, and distribution networks using smart-grid technologies are required to match power generation and demand. Solar thermal should be promoted for low- to medium-temperature use as domestic hot water.

1.3. Demand-side measures should be more strongly supported by increasing the integration of energy efficiency activities in GCF energy projects. The GCF should clarify how the variety of energy considerations and energy subsectors could be reflected in the results areas of the IRMF. For

instance, the GCF should consider establishing a results area on energy efficiency, whose benefits would include energy savings and GHG emissions reduction and improved indoor and outdoor air quality, water security, health and well-being, and poverty alleviation. This will also help the GCF balance its allocation between adaptation and mitigation, as energy efficiency projects and programmes in buildings and cities can have a high resilience impact for communities.

1.4. The GCF should consider new technologies in offshore wind, green hydrogen, energy storage and new approaches in the energy market, particularly those for energy efficiency, by using more of its piloting tools.

382. **Recommendation 2. The GCF should cultivate an energy portfolio that has a clear internal logic guided by the GCF's intended role to promote an energy (system) transition. The available tools for programming should be optimized accordingly, including (i) an explicit approach to a paradigm shift, (ii) clarifying the intended use of sectoral guidance, (iii) clarifying and developing guidelines for classifying energy projects, and (iv) fully operationalizing just transition principles in energy sector programming.**

2.1. Guidance from the Strategic Plan for the 2024–2027 period should be clearly interpreted in the energy sector strategic approach, including “hardest to reach” countries and “hard-to-abate” sectors (usually heavy industry and heavy-duty transport). The evaluation team recommends that the “hardest to reach” countries should be defined for application in the energy sector by taking into account (i) GHG emissions per inhabitant, (ii) perceived risk for private financing, and (iii) level of support from other financing institutions.

2.2. Operationally, this can be achieved by clarifying the purpose and intended use of GCF sectoral guides. The intended purpose of the guides needs to be further clarified by specifying the target audience and the scope of projects' compliance with the guides. The guides should be standardized to facilitate users' understanding and navigation. They should serve as guidance on potential project content only, without overlapping with other appraisal guidance documents and tools such as the Investment Criteria Scorecard. There should be separate guidance for energy access and power generation (as their purpose, scope and KPIs differ). Sectoral guides should be updated so cross-referencing is complete and coherent. All guides should have the same structure and clear cross-referencing. Finally, all sectors and sub-sectors should be covered, with the addition of some not sufficiently addressed areas, including solar water pumping, energy efficiency in public lighting and water/wastewater treatment, and regulatory support to the phase out of coal, oil and gas.

2.3. The GCF should clarify and develop guidelines within the sectoral guides for categorizing energy projects as adaptation or mitigation. This could be based on their expected impacts, leading to a better balance between mitigation and adaptation. For example, energy access projects produce adaptation results, which should be adequately reflected.

2.4. The GCF should clarify how it wishes to operationalize and mainstream the notion of just transition through the lens of energy transition. Clarity on just transition needs to be included in guidance and tools and assessed in projects at the proposal and monitoring stages to provide evidence on compliance of the GCF with just transition principles for the energy sector. If the GCF is willing to integrate just transition principles fully into its operation, as stated in the *Strategic Plan for the Green Climate Fund 2024–2027*, then the GCF should consider setting standards, building capacities and supporting the operationalization of just transition principles in energy sector investments, based on UNFCCC guidance.

383. **Recommendation 3. The GCF should take an active approach to supporting enabling environments and institutional capacities opportunistically, using the RPSP and FPs in the**

energy sector. The GCF should consider reviewing its in-country institutional set-up and engagement to increase its effectiveness.

3.1. Where the opportunity arises, RPSP grants could be more widely deployed in the energy sector to prepare institutions and enabling environments for sustainable project investments. Part of this could be to support the NDAs in engaging with key public energy sector stakeholders to better assess needs, identify institutional capacity constraints and regulatory barriers and facilitate project origination. The GCF could rely even more on the ongoing support of AEs, since they are already well acquainted with energy sector stakeholders through their ongoing development of energy projects.

3.2. The Secretariat should review the country engagement model, which shows limitations regarding stakeholders' engagement, and explore new ways for NDAs to engage more effectively with the line ministries and public institutions involved in the energy sector.

3.3. The GCF should strengthen its focus on the enabling environment, including strengthening institutional and regulatory frameworks; technology deployment, transfer and innovation; market development and transformation at the sectoral, local and national levels; and effective knowledge generation and learning, as set out in the IRMF. Particularly in public sector energy FPs, funds should be systematically dedicated to strengthening institutional capacities and enabling environments to mitigate potential barriers to successful implementation. For example, the GCF should consider project activity that enables regulatory change as being additional. This would allow it to support the strengthening of enabling environments and institutional capacities more effectively while complying with its additionality criteria.

384. **Recommendation 4. The GCF should match its actual and stated risk appetites and take the risks required to optimize its role in the sector. The GCF should learn from and reinforce successful operations, such as de-risking projects with blended finance. The GCF should clarify and promote its expectations for innovation in the energy portfolio. This may require revisiting the approach to, assessment of and tolerance for risk in projects, programmes and modalities that emphasize innovation.**

The GCF should develop clear guidelines on innovation in the energy sector and correlate them to the level of development of the target countries/markets, because what is considered an innovative investment in one country may be regarded as mainstream in another. There is typically a high correlation between innovation and project risk. If the GCF wants to finance more innovative projects, it must take on more risks. To achieve this, the GCF can take the following actions:

4.1. Adapt its risk appraisal methodologies for public and private sector initiatives to reflect (i) the level of innovation of the project, including a matching tiered risk tolerance, and (ii) the level of experience of the AE, with AEs complying with higher risk categories benefiting from greater risk tolerance from the GCF.

4.2. Consider increasing its appetite for credit risk in projects where the implementation risk is low and the expectation of achieving expected outcomes and a related paradigm shift is high, while continuing to de-risk projects using blended finance. The GCF can support riskier and less cost-effective energy sector projects.

4.3. Develop consistent guidelines to define and rank innovative projects for innovation in (i) technology development and deployment, (ii) business models, (iii) structuring of financial instruments, and (iv) changing market behaviour and catalysing systemic market development changes. These criteria must be adjusted for the specific market where the project is implemented.

4.4. Consider using RFPs to foster innovation and reactivating the discussion about the planned pilot programme to support climate technology incubators and accelerators.

385. **Recommendation 5. The Secretariat should consider revisiting results management. The GCF could pursue a differentiated approach for results reporting based on the initial RMF and the IRMF. The GCF should place more emphasis on improving quality at entry and preparation for monitoring and evaluation. To improve the aggregability and reporting of results in the energy sector, the GCF could clarify and, where possible, harmonize measurement methodologies. Within energy projects, the Secretariat might consider requesting data on just transition principles, innovation and co-benefits to align the reporting with the future stated strategic view on the GCF's approach to the energy sector.**

5.1. The GCF should especially improve the monitoring and results management of paradigm shift and innovation components, for the Fund. Expected results regarding innovation should be clearly stated at the FP stage and uploaded to the project database of the GCF.

5.2. Given that a full alignment between the indicators of the RMF and IRMF has not been possible for the GCF energy project portfolio, the GCF should consider differentiated reporting on results. Such differentiated reporting is particularly important for the following energy subsectors: “Energy generation and access”, “Energy efficiency” and “Transport”.

5.3. Evaluability and quality at entry of FPs should be improved by strengthening the monitoring and evaluation frameworks in project proposals. High-quality monitoring tools and approaches can help attribute causal changes to GCF investments in a credible manner, and ultimately improve reporting of results.

5.4. The GCF should explore ways and make efforts to ultimately direct a portfolio that is gender transformative, rather than only gender sensitive or gender neutral. As a first step, the GCF should improve the tracking of the results of the gender action plans and outcomes for Indigenous Peoples at the country and sector levels.

5.5. Energy savings, the principal direct result of energy efficiency projects, can be evaluated in multiple ways. The GCF does not set a specific methodology for determining energy savings, which is adapted to the context. Reviewing these methodologies could be part of an assessment for a sample of GCF-funded energy projects and pipeline energy projects. These methodologies should be further harmonized between AEs, where possible.

5.6. The GCF should revisit and further define types of co-benefits in GCF frameworks and policies. Revised co-benefits should relate to socioeconomic outcomes such as creating green jobs and improving health and education, observed in the global principles of just transition in the global energy sector. These considerations are important decision-making factors for national and development funding institutions and are key elements contributing to just energy transition. To the extent feasible, co-benefits should be reported according to beneficiary group socioeconomic status, including by gender and for Indigenous Peoples.

5.7. The GCF should consider further operationalizing the GCF's knowledge management function throughout the entire project and programme cycle, to support learning at the institutional level to inform project origination, country programming and future reviews of sectoral guidance.

ANNEX. LIST OF INTERVIEWEES

NAME	POSITION/TITLE	AFFILIATION
Abdullah Bikzad	iTAP Operations Consultant	GCF
Abigail Ngosa	Investment Officer	NAPSA
Abimanyu Aji	Climate Finance Programme Manager	Kemitraan Partnership
Achala Abeysinghe	Asia Director and Head of Programmes	Global Green Growth Institute (GGGI)
Adam Bornstein	Head of Financial Analysis and Product Innovation	GCF
Akabwa Nyambe	Economist & Sector Evaluator	NDA
Akanesi Seinileva Tolu	Department of Climate Change	MEIDECC
Alani Afu	Country Manager	Live and Learn
Alejandro Javier Perez Barrio	Senior Investment Officer	IFC
Alexander Sharabaroff	Senior Energy Specialist	IFC
Alfred Leger	Site Manager	AKUO
Alfred Vaka	Programme Officer	JICA
Alfredo Idiatre	GCF Roster Expert thematic of fundind proposals	External consultant
Aliz Crowley	Programme Officer - Planning and Programme Support & Project Facilitation and Support	IRENA
Amel El Abed	Analyst	CIF
Ana Rojas	Executive Director	ACERA
Analía Rosa	Senior Fiduciary Specialist	IDB
Andreas Fiebelkorn	Analyst (in charge of GCF communications)	EBRD
Andrés Rebolledo	Executive Secretary	OLADE
Andrey Chicherin	Innovation, Technology, and Co-Funding manager	GCF
Anupa Lamichhane	Regional Manager, Asia-Pacific	GCF
Anurag Mishra	Senior Renewable Energy Specialist	GCF
Arin Mizinga	Senior Economist	Ministry of Finance, Zambia
Ariunbold Sukhbaatar	Policy and Planning Department Senior Expert	Ministry of Energy, Mongolia
Arnaud Heckmann	Portfolio Management Unit Head, Nepal (former Head of Portfolio Management in Mongolia)	ADB
Atsuko Nuibe	GCF Focal point / Director, Sustainable Business Division	MUFG
Audrey-Cynthia Yamadjako	Focal Point	AfDB
Ayaka Kubota	Corporate Sustainability Department	Sumitomo Mitsui Bank Corporation (SMBC)
Balwyn Faotusia	Senior Country Officer	ADB
Bartley Ashani	Associate Programme Officer - Project Facilitation	IRENA

NAME	POSITION/TITLE	AFFILIATION
Batbold Erdenebat	Director General of Development Policy, Land Management, and Urban Planning Department	Ministry of Construction & Urban Development, Mongolia
Bathargal Zamba	Special Envoy of Climate Change of Mongolia	Government of Mongolia
Batsaikhan B	Business Development Specialist	MMS Green Building
Beatrice Kapopo	Customer	WidEnergy
Bertha Argueta	Policy Advisor for Climate Finance and Development	Germanwatch
Bertha Chiudza	Environmental and Social Safeguards Specialist	GCF
Bold Magvan	CEO	MGFC
Brian Motherway	Head of the Energy Efficiency Division	IEA
Brian Mainza	Principal Energy Officer	Ministry of Energy, Zambia
Brighton Kajokoto	Manager Investment	NAPSA
Byambadorj Bilegsaikhan	Business Development & Partnership Manager	Mongolian Sustainable Finance Association
Camilo Ramirez Isaza	International Cooperation - Sustainable Development and Policy - Renewable Energy	IRENA
Carlos Berner	Director of Financial Risk and Guarantee of Educational Infrastructure	CORFO
Carmenza Robledo Abad	Associated Senior Researcher, ETH Zürich; CEO	ECOEXISTENCE
Carolina Fuentes	Director	GCF
Caroline Peterson	Member of Advisory Board	UN Decade on Ecosystem Restoration
Casie Cohen	First Secretary (Development)	Australian High Commission
Caterin Pinto	Ministerial Cabinet Advisor	Ministry of Transport and Telecommunications, Chile
Cayetano Casado Gomez Guillamon	Regional Manager for Latin America and the Caribbean	GCF
Celine Thoniard	Climate Finance Expert	AFD
Chandrasekar Govindarajalu	Lead Energy Specialist	WB
Charina Cabrido	Sector Guides Management Consultant	GCF
Charlie Troughton	Director	MPEPO Power
Chisha Chisha	Business Development Manager	Africa GreenCo
Christiaan Gischler	Lead Energy Specialist	IDB
Christian Ellermann	Senior Climate Change Specialist	ADB

NAME	POSITION/TITLE	AFFILIATION
Christine Shaba	Customer	WidEnergy
Christopher Faleola	Adaptation Officer, Department of Energy	MEIDECC – Vava'u
Collette Mwanza	Manager Corporate Finance	ZESCO
Craig Myles Cogut	Founder, Chairman & CEO	Pegasus Capital Advisors (PCA)
Cristina Victoriano	Deputy Executive Director	Energy Sustainability Agency (Chile)
Daelisi Njobvu	Communications & Policy Advisor	GET FiT Programme
Daniel Josifovsky	Advisor	GIZ
Dario Liguti	Director Sustainable Energy Division	United Nations Economic Commission for Europe
Davaa Altanzul	Project & Partnership Manager	Mongolian Sustainable Finance Association
David Howell	Project Development Officer, Eco Banking Department	XacBank
Demetrio Innocenti	SAP/PPF/EDA Manager	GCF
Dorien Lobeek	Fund Manager	FMO
Teodora Grncarovska	State Counsellor on Climate Change	Ministry of Environment and Physical Planning, North Macedonia
Eduardo Freitas	Regional Manager Africa	GCF
Edwina Tangitau	Programme Manager (Energy)	Australian High Commission
Eleni Tevi	Specialist	European Commission Tonga
Eliate Laulaupeaálu	Principle Energy Planer, Energy Sector Team	MEIDECC – Department of Energy, Tonga
Elisabeth Ngoma Musonda	Technical Trainer	ZENGO
Emeline Veikoso Laumanu	Energy Efficiency Specialist	MEIDECC
Enkh Erdenekhuyag	Senior Project Development Officer, Eco Banking Department	XacBank
Erdenebayar J	Head of Business Development	MMS Green Building
Eria Mardhawati	Product Development Team Leader	PT Indonesia Infrastructure Finance
Erik Ruiz Araya	Deputy Director, Project Facilitation and Support (PFS)	IRENA
Ese Fulivai	Safeguard Officer	TREP
Estimoor Kaufusi	JNAP Specialist, Policy and Planning Division, Department of Climate Change	MEIDECC

NAME	POSITION/TITLE	AFFILIATION
Euan Low	Climate Impact Area Lead (Energy and Industry)	GCF
Eugene Chandi	Acting Senior Economic Analyst	Rural Electrification Authority, Zambia
Fakhul Aufa	Head of SDG Indonesia One	PT SMI
Fidelis Kasanda	Engineer Renewable Energy	Electricity Regulatory Board, Zambia
Filippo Berardi	Sr. Climate Change Specialist	GEF
Francis Mpampi	National Coordinator	NDA
Francisca Valenzuela	Head of the Gender and Human Rights Office	“Energía + Mujer” Programme, Chile
Geraldine Ang	Team Lead, Clean Energy Finance and Investment Mobilization Programme, Team Lead, Financial System for Biodiversity and Transition Minerals (FBM), Senior Policy Analyst	Organisation for Economic Co-operation and Development
German (Jerry) Velasquez	Director of the Division of Mitigation and Adaptation	GCF
Gloria Visconti	GCF Focal point/Lead Climate Change Specialist	IDB
Hansol Park	Climate Policy and Governance Specialist a.i.	GCF
Henky Wilmar	Manager for Offshore Funding and Grants, Corporate Finance Division	PT PLN, Indonesia
Henry Gonzalez	Deputy Executive Director	GCF
Hyejin Namgung	Knowledge Products and Sectoral Guides Management Assistant Consultant	GCF
Igor Slavkoski	International Climate Finance Specialist	FAO
Ina Hoxha	Global Investment Director for Climate and Water	Investment Fund for Developing Countries
Ivo Besselink	Sector Senior Specialist, Energy and Industries	GCF
Jack Musaka	Senior Credit Specialist	ZANACO, Zambia
Jackeline Musonda	Director - Strategy & Planning	Rural Electrification Authority, Zambia
Jaeseung Lee	Country Representative	GGGI
Jan Martin Witte	Senior Advisor for Sustainable Energy Finance	Tetra Tech ESI
Jauad El Kharraz	Executive Director	Regional Center for Renewable Energy and Energy Efficiency (RCREEE)
Jennifer Rubis	Indigenous Peoples and Social Safeguards Specialist	GCF
Jenny Hyun Jung Ahn	Team Assistant	GCF
Jenny Mager	Head of Climate Change Division	Ministry of Environment, Chile
Jim Walker	Director (former)	SE4All
Jose Frazier Gomez	Environment and Social Specialist	GCF

NAME	POSITION/TITLE	AFFILIATION
Jose Lopez	Energy experts	AFD/Proparco
Joseph Williams	Coordinator Energy Unit	CDB
Josh Helu	Managing Director	JH Electrical, Tonga
Judy Raphael	Programme Director	GET FiT Programme, Zambia
Jurg Grutter	CEO	Grutter Consulting
Jussi Tapio Lehmusvaara	Operations Officer, Blended Finance	IFC
Kabaso Kawe	Principal Economist	Ministry of Finance, Zambia
Kalolaine Kavaefiafi	Officer in Charge/Finance Manager	Tonga Community Development Trust
Karl Upston-Hooper	General Counsel	CAMCO
Kavita Sinha	Director, PSF	GCF
Keasi Pongi	Executive Director	Civil Society Forum of Tonga
Kénéf Delusca	Associate Professor	Institute of sciences, technologies and advanced studies of Haiti
Khishigjargal Kharkhuu	Programme Analyst, Climate Change, UNDP Mongolia Country Office	United Nations Development Programme
Kimberly Cantillana	Climate Finance Professional	Ministry of Environment, Chile
Kristina Mitic	National Team Leader	FAO
Lano Fonua	Investment Officer	GGGI
Laode Syarif	Executive Director	Kemitraan Partnership
Liane Schalatek	Associate Director	Heinrich-Böll-Stiftung Washington D.C.
Lilian Macharia	Director of Portfolio Management	GCF
Liliane M.N. Chabuka	CEO	WidEnergy
Linda Thompson	Managing Director	MPEPO Power
Lisso Matanga Simbeleko	Programme Manager	ElectriFi
Longo Chellah	Associate Trading Manager	Africa GreenCo
Lucia Fuselli	Senior Energy Efficiency Specialist	GCF
Lucy Faànuunu	Officer in Charge	MEIDECC – Vava'u
Luisa Tuiafitu Malolo	Director for Climate Change, Department of Climate Change	MEIDECC
Magdalena Daskalova	Renewable Energy Advisor	Ministry of Economy, North Macedonia

NAME	POSITION/TITLE	AFFILIATION
Majeed Zulqarnain	Sector Guides Management Consultant	GCF
Malia Avala	Climate Change Technical Officer, Department of Energy	MEIDECC – Vava’u
Malini Teulilo	GCF Readiness Focal Point	Chamber of Commerce of Tonga
Manase Naiteitei	Department of Energy	MEIDECC – Vava’u
Marcel Heijman	Senior Restructuring Specialist - Funded Activities	GCF
Marcel Silva	Head of Self-consumption Development Unit	Ministry of Energy, Chile
Marcelino Madrigal	Energy Division Chief	IDB
Maria Ann Dumpert	Energy and Climate Change Specialist	CIF
Maria Shishovska	EU Strategy Support	Ministry of Economy, North Macedonia
Martín Lobos	International Finance Coordination Advisor	Ministry of Finance, Chile
Mathieu Geze	Director Asia	HDF Energy, Indonesia
Mayuresh Patange	Financial Institutions Manager	GCF
Mercy Phiri	Kabwe Service Centre Officer	WidEnergy
Michael Ahokava	Specialist	Tonga Power
Michael M. Mulasikwanda	Assistant Director	Ministry of Energy, Zambia
Mike Mabboho	Sales Agent for Chikonkomene	WidEnergy
Moala Loketi	Coordinator	Live and Learn Tonga
Mogale Harold	Climate Change Specialist	DBSA
Monba Tambele	Associate	MPEPO Power
Moubarak Moukaila	Head of Environment and Climate Finance	Former BOAD
Muchsin Qadir	Energy Specialist, East Asia and Pacific Region	World Bank
Muhammed Sayed	Climate Change Specialist, Climate Finance	DBSA
Mujib Fatan	Project Manager	<i>Electricité de France</i> Indonesia
Munalula Mulonda	Senior Manager	ZANACO
Natacha Marzolf	Principal Energy Specialist	IDB
Natalie Jones	Policy Advisor	IISD
Natasha Marzoff	Principal Energy Specialist	IDB
Natia Lokotui	Development Officer	Civil Society Forum of Tonga
Nicolas Hasselbach	Operating Advisor	Pegasus Capital Advisors (PCA)
Nomin Gereltbaatar	Project Development Officer, Eco Banking Department	XacBank

NAME	POSITION/TITLE	AFFILIATION
Nonhlanhla Zindela	Deputy Director and Head of Programming	GCF
Noor Syaifudin	Senior Policy Analyst	NDA Fiscal Policy Agency, Indonesia
Nurul Fadila	Marketing Manager	PT Supraco Indonesia, Radiant Utama Group
Nyamsuren Davaatseren	Head of Green Funding Office, Foreign Fund Management and Monitoring Unit, International Banking Department	HMB
Olympus Manthata	Head, Climate Finance	DBSA
Otgontsetseg Luvsandash	Secretariat of JCM	Ministry of Environment & Tourism, Mongolia
Paco Gimenez-Salinas	Head of Independent Redress Mechanism Uniut a.i.	GCF
Pal Monojeet	Manager RE/EE	AfDB
Patricio Sepúlveda	Head of the Chilean Debt Office	Ministry of Finance, Chile
Paul Kellet	Programme Manager	United Nations Environment Programme U4E
Paula R. Glover	President	Alliance to save energy
Paula U	Chief Secretary and Secretary to Cabinet	Prime Minister's Office, Tonga
Paz Araya	Researcher	Energy Poverty Network
Pegalili Tohi	Specialist	Tonga Power - Major Project
Preksha Krishna Kumar	Registrar & Case Officer	GCF
Prem Jain	UNESCO Chair	University of Zambia
Puti Faranizaq	Public Sector Financing Division	PT SMI, Indonesia
Rahman Anindito	Project Manager	PT Indonesia Infrastructure Finance
Rajeev Mahajan	Project Finance Manager	GCF
Rama Aditia	Project Secretary	PT Indonesia Infrastructure Finance
Randolph Koppa	Chairman, Representative Governing Board	HMB
Remi Lafond	Energy experts	AFD/Proparco
Rey Guarin	Climate Change Investment Adviser	ProClime
Reynaldo Cabezas	Executive Secretary Committee for Sustainability	Energy Poverty Network
Rhedgis Egis Tembo	Chief Economy Officer	Department of Green Economy and Climate Change
Ricardo Nogueira	Senior Advisor / Independent Climate Finance	

NAME	POSITION/TITLE	AFFILIATION
	Expert	
Rio Silitonga	Energy Efficiency Analyst	ASEAN Center for Energy, Indonesia
Ronen Gani	Operating Partner	Pegasus Capital Advisors (PCA)
Ryan Oetema	Senior Investment Manager	CIO
Ryando PV	Project Manager of Solar PV	PT Supraco Indonesia, Radiant Utama Group
Ryota Maeda	Corporate Sustainability Department	SMBC
Sam Jewett	ESG Insights Manager	Acumen
Sam Vea	President	Chamber of Commerce of Tonga
Samuel Alterescu	Corporate Sustainability Department	SMBC
Sandra Andovska	Advisor	Cabinet of the Deputy Prime Minister in Charge of Economic Affairs, Coordination of Economic Sectors and Investments, North Macedonia
Saori Nishida	Corporate Sustainability Department	SMBC
Saurabh Kaura	Climate Investment Specialist	GCF
Seblewongel Negussie	Environmental and Social Safeguards, Gender and Indigenous Peoples Manager	GCF
Selina Wrighter	Head of Policy and Strategy	GCF
Septia Supendi	GCF Programme Manager	ASEAN Center for Energy, Indonesia
Shakil Kumar Beedassy	GCF coordination team (pipeline dev and restructuring of projects)	AfDB
Shania Manaloe	Associate APAEC Officer	ASEAN Center for Energy, Indonesia
Shannon Cowlin	Energy Expert	ADB
Silvia Namukanzya	Customer	WidEnergy
Simainga Brenda	Environmental Specialist	NDA
Simon Wilsom	Programme Manager	TREP PMU – Energy Department, Tonga
Sione Misi	Energy Planner	MEIDECC - Department of Energy
Sirpa Jarvenpaa	Director	Energy Transition Partnership
Stefan Kostovski	Associate Banker, Energy Europe	EBRD
Steven Mwinga	Senior Manager Electricity	Electricity Regulatory Board

NAME	POSITION/TITLE	AFFILIATION
Subin Cho	Pipeline and Portfolio Insights Specialist	GCF
Sue Kyung Hwang	Executive Assistant	GCF
Susie Shuford	GCF Focal point / Portfolio Manager, Public Investment Management	FMO
Sylvain Taboni	Corporate Social Responsibility	BMP Paribas
Takacs Hannes	Head of Mongolia Country Representation	EBRD
Tara Daniel	Senior Programme Manager	Women's Environment and Development Organization
Tara Lynn Patterson	Intern	GCF
Tariq Ahmed	Regional Programme Officer - MENA Region	IRENA
Teisa Atida	Accountant	TREP
Tetsuji Nakasone	Project Formulation Advisor	JICA
Tim Corfield	Operating Partner	Pegasus Capital Advisors (PCA)
Timothy Afful-Koomson	Chief Climate Finance Officer	AfDB
Timothy Kabandama	Assurance Manager	NAPSA
Titilope Gbemisola Akosa	Director	21st Century Issues
Tsendenjav Zandabazar	Director of EE & Conservation Department	Mongolia Energy Regulatory Commission
Tsevegjav Gumenjav	CEO	XacBank
Tsolmon Namkhainyam	Modern Energy Technologies Lead	USAID Mongolia Energy Governance Activity Programme, Abt Associates
Tuul Galzagd	Director, Eco Banking	XacBank
Vahid Fifita	Project Manager	Tonga Power
Vidya Fauzianti	Project Manager	GGGI
Wezi Gondwe	Head of Business Development	Africa GreenCo
Willem Lijnders	Associate – Public Investment Management and Blending	FMO
Willy Chigoma	Manager Treasury	NAPSA
Woo Yul Lee	Principal Energy Specialist	ADB
Y Wirawan	Managing Director, Investment Directorate	PT Indonesia Infrastructure Finance
Zhihong Zhang	GCF Focal point / Senior Carbon Finance Specialist	WB

Note: Due to legal and ethical considerations, we are not permitted to identify or list any agencies who have applied for but not yet received accreditation. These agencies are therefore not listed.

REFERENCES

- Abrams, Simone, and others (2022). Just Transition: A Whole-Systems Approach to Decarbonisation. *Climate Policy*, vol. 22, No. 8, pp. 1033–49. Available at <https://doi.org/10.1080/14693062.2022.2108365>.
- ADB Independent Evaluation Department (2020). Energy Sector Project Evaluations, 2015–2019. Synthesis note No. 2. Manila, Philippines. Available at <https://www.adb.org/documents/energy-sector-project-evaluations-2015-2019>.
- _____ (2021). *ADB Support for Action on Climate Change, 2011–2020*. Manila, Philippines. Available at <https://www.adb.org/documents/thematic-evaluation-adb-support-action-climate-change-2011-2019>.
- African Development Bank (2012). *Energy Sector Policy of the AfDB Group*. Available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Energy_Sector_Policy_of_the_AfDB_Group.pdf.
- Agence Française de Développement (2021). *Energy Transition Strategy 2019–2022, Mid-Term Review Summary*. Paris, France. Available at <https://www.afd.fr/en/ressources/energy-transition-strategy-2019-2022-mid-term-review>.
- Anantharajah, Kirsty, and Abidah B. Setyowati (2022). Beyond Promises: Realities of Climate Finance Justice and Energy Transitions in Asia and the Pacific. *Energy Research & Social Science*, vol. 89 (July), 102550. Available at <https://doi.org/10.1016/j.erss.2022.102550>.
- Araújo, Ofélia de Queiroz F., and others (2024). Beyond Clean and Affordable Transition Pathways: A Review of Issues and Strategies to Sustainable Energy Supply. *International Journal of Electrical Power & Energy Systems*, vol. 155, Part A (January), 109544. Available at <https://doi.org/10.1016/j.ijepes.2023.109544>.
- Asian Development Bank (2023). *2021 Energy Policy of the Asian Development Bank: Supporting Low-Carbon Transition in Asia and the Pacific*. Available at <https://www.adb.org/documents/energy-policy-supporting-low-carbon-transition-asia-and-pacific>.
- Baastel (2023). *Processes and Policies of the GEF and the GCF: A Comparative Analysis to Foster Complementarity and Coherence*. GEF-GCF. Available at <https://www.thegef.org/documents/processes-and-policies-gef-and-gcf-comparative-analysis-foster-complementarity-and>.
- Babayomi, Oluleke O., Davo A. Dahoro and Zhenbin Zhang (2022). Affordable Clean Energy Transition in Developing Countries: Pathways and Technologies. *iScience*, vol. 25, No. 5, 104178. Available at <https://doi.org/10.1016/j.isci.2022.104178>.
- Brown, Louise, and Natalia Alayza (2021). Why the Green Climate Fund Should Give Developing Countries Greater Direct Access to Finance. *World Resources Institute*, 4 June. Available at <https://www.wri.org/insights/why-green-climate-fund-should-give-developing-countries-greater-direct-access-finance>.
- Buchner, Barbara, and others (2023). *Global Landscape of Climate Finance 2023*. Climate Policy Initiative. Available at <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Global-Landscape-of-Climate-Finance-2023.pdf>.
- Cha, J. Mijin (2018). From the Dirty Past to the Clean Future: Addressing Historic Energy Injustices with a Just Transition to a Low-Carbon Future. In *Routledge Handbook of Climate Justice*. Routledge.
- Climate Investment Funds (2023). *CIF Annual Report 2022: Delivering Results*. Washington, D.C. Available at <https://www.cif.org/news/cif-annual-report-2022-delivering-results>.
- _____ (2024). Programs. Available at <https://www.cif.org/cif-programs>.
- _____ (n.d.). CIF Renewable Energy Integration Program (Brief).
- Doyon, Andréanne, Jonathan Boron and Stephen Williams (2021). Unsettling Transitions: Representing Indigenous Peoples and Knowledge in Transitions Research. *Energy Research & Social Science*, vol. 81 (November), 102255. Available at <https://doi.org/10.1016/j.erss.2021.102255>.
- Energy Transitions Commission (2018). *Mission Possible: Reaching Net-Zero Carbon Emissions*. Available at <https://www.energy-transitions.org/publications/mission-possible/>.
- European Bank for Reconstruction and Development (2018). *Energy Sector Strategy 2019–2023*.
- European Investment Bank (2023). *2022 Joint Report on Multilateral Development Banks' Climate Finance*. Available at <https://www.eib.org/en/publications/20230128-2022-joint-report-on-multilateral-development-banks-climate-finance>.

- Falchetta, Giacomo, and others (2022). Harnessing Finance for a New Era of Decentralised Electricity Access: A Review of Private Investment Patterns and Emerging Business Models. *Energy Research & Social Science*, vol. 90 (August), 102587. Available at <https://doi.org/10.1016/j.erss.2022.102587>.
- GEF Secretariat (2022). GEF-8 Programming Directions. Working document. GEF/R.08/29/Rev.01. Washington, D.C.: Global Environment Facility. Available at <https://www.thegef.org/council-meeting-documents/gef-r-08-29-rev-01>.
- Global Climate Action and Marrakech Partnership (2020). *Climate Action Pathway: Energy – Executive Summary*. United Nations Framework Convention on Climate Change. Available at https://unfccc.int/sites/default/files/resource/ExecSumm_Energy_1.pdf.
- Global Environment Facility (2022). *Initial GEF-8 STAR Country Allocations*. Washington, D.C. Available at <https://www.thegef.org/council-meeting-documents/gef-c-63-inf-05>.
- _____ (2023). *Climate Change Mitigation*. Washington, D.C. Available at <https://www.thegef.org/newsroom/publications/climate-change-mitigation>.
- Green Climate Fund (2015). *Monitoring and accountability framework for accredited entities*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/monitoring-and-accountability-framework-accredited-entities>.
- _____ (2016). *Initial Strategic Plan for the GCF*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/initial-strategic-plan-gcf>.
- _____ (2017). *Risk Appetite Statement (Component II)*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/risk-appetite-statement-component-ii>.
- _____ (2019). GCF/B.24/12: Gender Policy. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/gender-policy>.
- _____ (2020). GCF/B.27/21: Updated Strategic Plan for the Green Climate Fund: 2020–2023. Available at <https://www.greenclimate.fund/document/gcf-b27-21>.
- _____ (2021a). GCF/B.28/11/Add.02: Methodology for Establishing a Baseline of Greenhouse Gas Emissions and Climate Resilience for the Portfolio of Accredited Entities. Available at <https://www.greenclimate.fund/document/gcf-b28-11-add02>.
- _____ (2021b). Thematic Brief: Renewable Energy. Available at <https://www.greenclimate.fund/document/thematic-brief-renewable-energy>.
- _____ (2021c). *Sectoral Guide: Cities, Buildings and Urban Systems*. Sectoral Guide Series. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/sectoral-guide-cities-buildings-and-urban-systems>.
- _____ (2022a). *Annex I: Investment Criteria Scorecard*. GCF Guidebook Series: Appraisal Guidance. Songdo, South Korea. Available at <https://www.greenclimate.fund/sites/default/files/document/gcf-appraisal-guidance-annex-1-v3.pdf>.
- _____ (2022b). *Integrated Results Management Framework Results Handbook*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/results-handbook>.
- _____ (2022c). *Sectoral Guide: Energy Access and Power Generation*. Sectoral Guide Series. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/sectoral-guide-energy-access-and-power-generation>.
- _____ (2022d). *Updated Simplified Approval Process and Activity Cycle*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/updated-simplified-approval-process-and-activity-cycle>.
- _____ (2022e). *Annex IV: Innovation and Additionality Tool*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/innovation-and-additionality-tool>.
- _____ (2022f). *Sectoral Guide: Low Emission Transport*. Sectoral Guide Series. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/sectoral-guide-low-emission-transport>.
- _____ (2022g). *Sectoral Guide: Energy Efficiency*. Sectoral Guide Series. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/sectoral-guide-energy-efficiency>.
- _____ (2023a). GCF/B.35/Inf.02: Annual Report 2022 of the Independent Evaluation Unit. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/gcf-b35-inf02>.
- _____ (2023b). GCF: Catalysing finance for climate solutions. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/catalysing-finance-for-climate-solutions>.

- _____ (2023c). *Readiness and Preparatory Support Programme Guidebook*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/readiness-and-preparatory-support-guidebook>.
- _____ (2023d). *Simplified Approval Process*. Green Climate Fund, 23 August. Available at <https://www.greenclimate.fund/projects/sap>.
- _____ (2023e). *Strategic Plan for the Green Climate Fund 2024–2027*. Songdo, South Korea. Available at <https://www.greenclimate.fund/document/strategic-plan-green-climate-fund-2024-2027>.
- ICF (2022). *Evaluation of the Scaling up Renewable Energy Program (SREP) in Low-Income Countries*. Available at <https://www.icf.com/clients/climate/global-energy-programs>.
- Independent Evaluation Unit (2019). *Independent Evaluation of the Green Climate Fund's Country Ownership Approach*. Evaluation Report No. 4. Songdo, South Korea: Independent Evaluation Unit, Green Climate Fund. Available at <https://ieu.greenclimate.fund/document/final-report-independent-evaluation-gcfs-country-ownership-approach-coa2019>.
- _____ (2020). *Independent Evaluation of the Relevance and Effectiveness of the Green Climate Fund's Investments in Small Island Developing States*. Evaluation Report No. 8. Songdo, South Korea: Independent Evaluation Unit, Green Climate Fund. Available at <https://ieu.greenclimate.fund/document/independent-evaluation-relevance-and-effectiveness-green-climate-funds>.
- _____ (2021). *Independent Evaluation of the Green Climate Fund's Approach to the Private Sector*. Evaluation Report No. 10. Songdo, South Korea: Green Climate Fund. Available at <https://ieu.greenclimate.fund/sites/default/files/document/priv2021-final-report-vol-i.pdf>.
- _____ (2023a). *Independent Evaluation of the GCF's Readiness and Preparatory Support Programme*. Evaluation Report No. 16 (September). Songdo, South Korea: Green Climate Fund. Available at <https://ieu.greenclimate.fund/evaluation/RPSP2023>.
- _____ (2023b). *Independent Evaluation of Green Climate Fund's Approach to the Energy Sector. Approach paper*. Songdo, South Korea: Independent Evaluation Unit, Green Climate Fund. Available at <https://ieu.greenclimate.fund/document/approach-paper-independent-evaluation-green-climate-funds-approach-energy-sector>.
- Inter-American Development Bank, Energy Division (2018). *Energy Sector Framework Document*. Available at <https://www.iadb.org/en/who-we-are/topics/energy/sector-framework-energy>.
- International Energy Agency (2017). *Energy Access Outlook 2017: From Poverty to Prosperity*. Available at <https://www.iea.org/reports/energy-access-outlook-2017>.
- _____ (2021a). *Financing Clean Energy Transitions in Emerging and Developing Economies – Analysis*. Available at <https://www.iea.org/reports/financing-clean-energy-transitions-in-emerging-and-developing-economies>.
- _____ (2021b). *Global EV Outlook 2021: Policies to Promote Electric Vehicle Deployment*. Available at <https://www.iea.org/reports/global-ev-outlook-2021/policies-to-promote-electric-vehicle-deployment>.
- _____ (2021c). *Secure Energy Transitions in the Power Sector – Analysis*. Available at <https://www.iea.org/reports/secure-energy-transitions-in-the-power-sector>.
- _____ (2022). *World Energy Outlook 2022 – Analysis*. Available at <https://www.iea.org/reports/world-energy-outlook-2022>.
- _____ (2023a). *Bioenergy*. Available at <https://www.iea.org/energy-system/renewables/bioenergy>.
- _____ (2023b). *Energy Efficiency: The Decade for Action – Analysis*. Available at <https://www.iea.org/reports/energy-efficiency-the-decade-for-action>.
- _____ (2023c). *Transport*. Available at <https://www.iea.org/energy-system/transport>.
- International Energy Agency and others (2023). *Tracking SDG7: The Energy Progress Report 2023*. Available at <https://www.irena.org/Publications/2023/Jun/Tracking-SDG7-2023>.
- International Renewable Energy Agency (2022a). *NDCs and Renewable Energy Targets in 2021*. Available at <https://www.irena.org/publications/2022/Jan/NDCs-and-Renewable-Energy-Targets-in-2021>.
- _____ (2022b). *IRENA Goes Beyond the Talk to Address Financing Challenges in Developing Countries*. IRENA, 21 July. Available at <https://www.irena.org/News/articles/2022/Jul/IRENA-Goes-Beyond-the-Talk-to-Address-Financing-Challenges-in-Developing-Countries>.
- _____ (2022c). *Scaling Up Renewables in Landlocked Developing Countries*. Abu Dhabi. Available at <https://www.irena.org/Publications/2022/Sep/Scaling-up-renewables-in-landlocked-developing-countries>.

- _____ (2023). *World Energy Transitions Outlook 2023: 1.5°C Pathway*. Volume 1. Abu Dhabi. Available at <https://www.irena.org/Publications/2023/Mar/World-Energy-Transitions-Outlook-2023>.
- Intergovernmental Panel on Climate Change (2022). *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva, Switzerland. Available at <https://www.ipcc.ch/report/ar6/wg3/>.
- _____ (2023). Summary for Policymakers. In *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by the Core Writing Team, Hoesung Lee, and José Romero, 1–34. Geneva, Switzerland. Available at https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf.
- Mejía-Montero, Adolfo, Lourdes Alonso-Serna and Carlo Altamirano-Allende (2020). Chapter 17 – The Role of Social Resistance in Shaping Energy Transition Policy in Mexico: The Case of Wind Power in Oaxaca. In *The Regulation and Policy of Latin American Energy Transitions*, Lucas Noura Guimarães, eds. Elsevier. Available at <https://doi.org/10.1016/B978-0-12-819521-5.00017-6>.
- Morandi, Paula, and Amy Lewis (2023). 2022 IDB Climate Finance Database. Inter-American Development Bank. Available at <https://doi.org/10.18235/0005117>.
- Ribera, Teresa, and Fatih Birol (2023). Climate and Energy Summit: Co-Chairs' Statement. *International Energy Agency*, 2 October. Available at <https://www.iea.org/news/climate-and-energy-summit-co-chairs-statement>.
- Sayegh, Alexandre Gajevic (2018). Climate Finance: Moral Theory and Political Practice. In *Routledge Handbook of Climate Justice*. Routledge.
- United Nations Framework Convention on Climate Change (2023a). *Implementation of Just Transition and Economic Diversification Strategies: A Compilation of Best Practices from Different Countries*. Bonn, Germany. Available at <https://unfccc.int/documents/624596>.
- _____ (2023b). *Technical Dialogue of the First Global Stocktake*. Synthesis report by the co-facilitators on the technical dialogue. FCCC/SB/2023/9. Available at https://unfccc.int/sites/default/files/resource/sb2023_09_adv.pdf.
- _____ (n.d.). Climate Action Pathways. United Nations Climate Change. Available at https://unfccc.int/climate-action/marrakech-partnership/reporting-and-tracking/climate_action_pathways. Accessed on 16 November 2023.
- United Nations (2022). *Accessing Climate Finance: Challenges and Opportunities for Small Island Developing States*. Available at <https://www.un.org/ohrlls/sids%20climate%20financing%20report%202022>.
- _____ (2023). *The Sustainable Development Goals Report 2023*. Available at <https://unstats.un.org/sdgs/report/2023/>.
- United Nations Economic Commission for Europe (2023). *Advancing Energy Resilience and Decarbonization across the ECE Region: Unleashing the Potential of Energy Storage and Demand-Side Flexibility*. ECE/ENERGY/GE.6/2023/6. Geneva, Switzerland. Available at <https://unece.org/sed/documents/2023/08/advancing-energy-resilience-and-decarbonization-across-ece-region-unleashing>.
- Wang, Xinxin, and Kevin Lo (2021). Just Transition: A Conceptual Review. *Energy Research & Social Science*, vol. 82 (December), 102291. Available at <https://doi.org/10.1016/j.erss.2021.102291>.
- World Bank Group (2021). *World Bank Group Climate Change Action Plan 2021–2025: Supporting Green, Resilient, and Inclusive Development*. Washington, D.C.. Available at <https://openknowledge.worldbank.org/entities/publication/ee8a5cd7-ed72-542d-918b-d72e07f96c79>.
- World Economic Forum (2020). Transmission, Distribution, and the Clean Energy Transition. Article, 16 July. Available at <https://www.weforum.org/agenda/2020/07/transmission-distribution-clean-energy-transition/>.
- _____ (2023). Clean Hydrogen and Its Uses - Accelerating Clean Hydrogen Initiative. Available at <https://initiatives.weforum.org/accelerating-clean-hydrogen-initiative/clean-hydrogen-and-its-uses>.
- World Wide Fund for Nature (2019). *Carbon Pricing and the Multilateral Development Banks: Comparative Analysis and Recommendations*. Briefing paper. Available at https://wwf.panda.org/wwf_news/?347992/Carbon-pricing-and-the-multilateral-development-banks-Comparative-analysis-and-recommendations.

Zhang, Dongyang, Yumei Guo and Farhad Taghizadeh-Hesary (2023). Green Finance and Energy Transition to Achieve Net-Zero Emission Target. *Energy Economics*, vol. 126 (October), 106936. Available at <https://doi.org/10.1016/j.eneco.2023.106936>.



**GREEN
CLIMATE
FUND**

Independent
Evaluation
Unit



Independent Evaluation Unit
Green Climate Fund
175, Art center-daero, Yeonsu-gu
Incheon 22004
Republic of Korea
Tel. (+82) 032-458-6450
ieu@gcfund.org
<https://ieu.greenclimate.fund>