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

Country case study reports *(Volume III)*

June 2024

GREEN CLIMATE FUND
INDEPENDENT EVALUATION UNIT

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

COUNTRY CASE STUDY REPORTS

06/2024

CONTENTS

ABBREVIATIONS

ADB	Asian Development Bank
AE	Accredited entity
AfDB	African Development Bank Group
APR	Annual performance report
ASEAN	Association of Southeast Asian Nations
C&I	Commercial and industrial
CIO	Climate Investor One
CP	Country programme
DAE	Direct access entity
EBRD	European Bank for Reconstruction and Development
EE	Energy efficiency
ENDC	Enhanced nationally determined contribution
ESS	Environmental and social safeguards
FMO	Netherlands Development Finance Company
FP	Funding proposal
GCF	Green Climate Fund
GDP	Gross domestic product
GEF	Global Environment Facility
GGGI	Global Green Growth Institute
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GW	gigawatt
IAE	International accredited entity
IBRD	International Bank for Reconstruction and Development
IDB	Inter-American Development Bank
IEU	Independent Evaluation Unit of the Green Climate Fund
IFAD	International Fund for Agricultural Development
IFI	International financial institution
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
ktCO2e	Kilotons of CO2 equivalent
LEED	Leadership in Energy and Environmental Design
MW	Megawatt
MDB	Multilateral development bank
MSME	Micro-, small- and medium-sized enterprise
NAP	National adaptation plan
NDA	National designated authority

NDC	Nationally determined contribution
PPA	Power purchase agreement
RES	Renewable energy sources
RPSP	Readiness and Preparatory Support Programme
SIDS	Small island developing State
TA	Technical assistance
Tcal	Teracalories
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
WB	World Bank

COUNTRY-SPECIFIC ABBREVIATIONS

Chile

ACERA	Chile Association for Renewable Energies
CNE	Chile National Energy Commission (Comisión Nacional de Energía)
CORFO	Chile Corporación de Fomento de la Producción
FYNSA	Chile Finanzas y Negocios S.A.Corredores de Bolsa
PAEE	Plan de Acción de Eficiencia Energética

Indonesia

ACGF	ASEAN Catalytic Green Finance Facility
GREM	Indonesia Geothermal Risk Mitigation Project
JETP	Just Energy Transition Partnership
MEMR	Ministry of Energy and Mineral Resources
PT SMI	PT Sarana Multi Infrastruktur

Mongolia

AHURP	Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Project
ASDIP	Aimags and Soums Green Regional Development Investment Programme
GEFF	Green Economy Financing Facilities
MGFC	Mongolia Green Finance Corporation
SRMI	Sustainable Renewables Risk Mitigation Initiative
TDBM	Trade and Development Bank of Mongolia

North Macedonia

GCAP	Green City Action Plan
MoEPP	Ministry of Environment and Physical Planning
PEEB	Programme for Energy Efficiency in Buildings

Tonga

MEIDECC	Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications
OISES	Outer Island Solar Electrification Society

TREP	Tonga Renewable Energy Project

Zambia

APCZ	Association of Power Companies of Zambia
CRI	Climate-resilient infrastructure
DBZ	Development Bank of Zambia
EARF	Energy Access Relief Facility
ERB	Energy Regulation Board
GESAP	Gender Equality Strategy and Action Plan
GET FiT	Global Energy Transfer Feed-in Tariff
IPP	Independent power producer
MoE	Zambia Ministry of Energy
REA	Rural Electrification Agency
SHS	Solar home systems
ZANACO	Zambia National Commercial Bank PLC
ZESCO	Zambia Electricity Supply Corporation

COUNTRY CASE STUDY REPORTS

1. CHILE COUNTRY CASE STUDY REPORT

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A. BACKGROUND AND CONTEXT

This country case study has been prepared as an input into the Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach, conducted by the Independent Evaluation Unit (IEU) of the Green Climate Fund (GCF). This country case study report on Chile is based on the results of a desk review and a country mission, including interviews undertaken from 17 to 21 July 2023. The country mission team included Krystian Feucht (Econoler consultant) and Susumu Yoshida (GCF IEU). Within one week, 14 interviews were conducted; however, there were limitations to the mission due to (i) the remote location of the project sites, and (ii) the not-yet-results generated by the projects to date.

1. COUNTRY CONTEXT

Table 1–1. Overview of Chile's country context

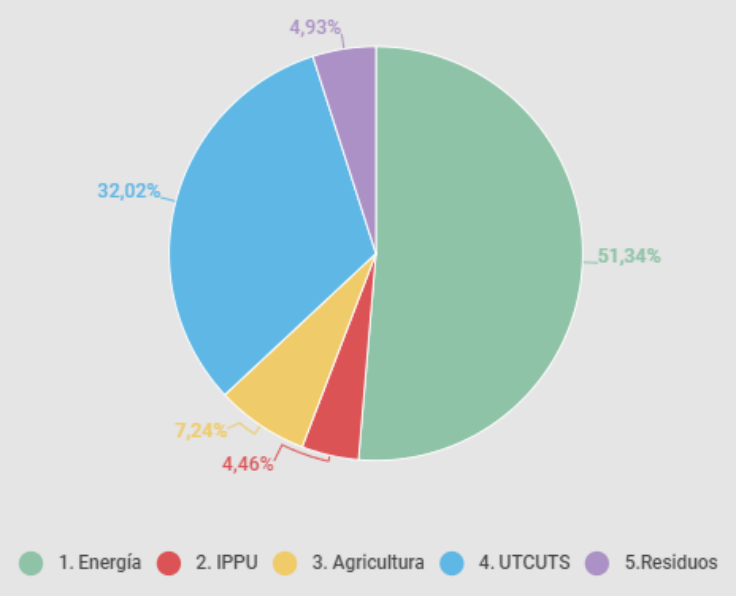
CATEGORY	COUNTRY
Demographics	The total population of Chile is 18,549,457 (2023 est.), of which around 88 per cent live in urban areas and 12 per cent live in rural areas. Approximately 90 per cent of the population is located in the middle third of the country, around the capital of Santiago; the far north (dominated by the Atacama Desert) and the extreme south are relatively underpopulated (Central Intelligence Agency, 2024). 8.6 per cent (2017 est.) of the population live in poverty (Central Intelligence Agency, 2024).
GCF group status	Latin America and the Caribbean
Governance conditions	As evaluated by the World Bank's (WB) six governance indicators (2021), Chile ranks relatively high for the Control of Corruption (82nd percentile), Rule of Law (81st percentile), Regulatory Quality (79th percentile), Voice and Accountability (79th percentile) and Government Effectiveness (71st percentile) indicators, and average on Political Stability and Action against Violence/Terrorism (49th percentile) (Kaufmann and Kraay, 2023). Fragile and conflict-affected State status (World Bank, 2022): N/A. Governance: Chile is a representative democratic republic; the President is Head of State, Head of Government and Head of a formal multiparty system. Executive power is exercised by the President and by Cabinet. Legislative power is vested in both the government and the two chambers of the national congress. The judiciary is independent of both the executive and legislature of Chile. The current President is Gabriel Boric.
Economic and development conditions	Development status (World Bank, 2023a): High income. Important economic sectors: Chile has several important economic sectors that contribute to its overall growth and development. The mining and minerals sector, particularly copper production, is a significant driver of the country's economy. Chile is the world's largest producer of copper and possesses abundant reserves of other minerals such as lithium and gold. The agricultural sector, known for its diverse climate and fertile land, contributes to Chile's economy through the export of fruits, vegetables, seafood and wine. Additionally, the manufacturing sector plays a vital role, creating employment opportunities and contributing to export earnings. Chile's real gross domestic product growth slowed to 2.4 per cent in 2022, as consumption normalized amid a sharp fiscal and monetary policy contraction (World Bank, n.d.). Chile's inflation rate has been high in recent years, and the annual inflation rate was 11.6 per cent in 2022 (WorldData, 2023).

CATEGORY	COUNTRY
	Outlook: Economic adjustment is expected to continue in the first half of 2023, led by a further drop in consumption amid contractionary policies, depleted household liquidity and a weakening labour-market. The economy is projected to recover gradually in the second half of the year, leading to an annual decline of 0.7 per cent for 2023, driven partially by a negative base effect from 2022 (World Bank, n.d.).
Access to finance	Access to finance in Chile has significantly improved over the years, and the country has a well developed financial system. Some key aspects of access to finance in Chile are as follows (World Bank Group, 2022): • Banking sector: Chile has a strong and stable banking sector that offers a wide range of financial services. Both domestic and international banks operate in the country, providing services such as deposit accounts, loans, mortgages and investment products. The banking sector is regulated by the Financial Market Commission to ensure financial stability and consumer protection. • Microfinance: Chile has made notable efforts to promote financial inclusion, particularly through microfinance initiatives. Microfinance institutions provide small loans, savings accounts and other financial services to individuals and small businesses that may have limited access to traditional banking services. These initiatives are aimed at supporting entrepreneurship, poverty reduction and economic development. • Capital market: Chile has a well developed capital market that provides opportunities for businesses to raise funds through equity and debt instruments. The Santiago Stock Exchange (Bolsa de Santiago) is the primary stock exchange in Chile, facilitating the trading of stocks, bonds and other securities. This enables companies to access capital for expansions, investments and innovations. • Digital banking and fintech: Chile has embraced technological advancements in the financial sector, leading to the growth of digital banking and fintech solutions. Mobile banking apps, online banking platforms and digital payment systems are widely available, making financial services more accessible and convenient for the population. Fintech startups have also emerged, offering innovative financial products and services including peer-to-peer lending, crowdfunding and mobile payment solutions. • Financial inclusion initiatives: The Government of Chile and financial institutions have implemented various initiatives to promote financial inclusion. These include financial education programmes, low-cost bank accounts and simplified banking processes for underserved populations. Efforts have been made to reach rural areas and vulnerable groups to ensure that a larger proportion of the population has access to financial services.

2. ENERGY SECTOR CONTEXT

In Chile, the energy sector is one of the primary sectors responsible for greenhouse gas (GHG) emissions and therefore contributes to climate change (Chile, Ministerio del Medio Ambiente, n.d.-a). Figure 1–1 illustrates the total GHG emissions in Chile by sector for 2020.

Figure 1–1. Total GHG emissions in Chile (2020) by sector

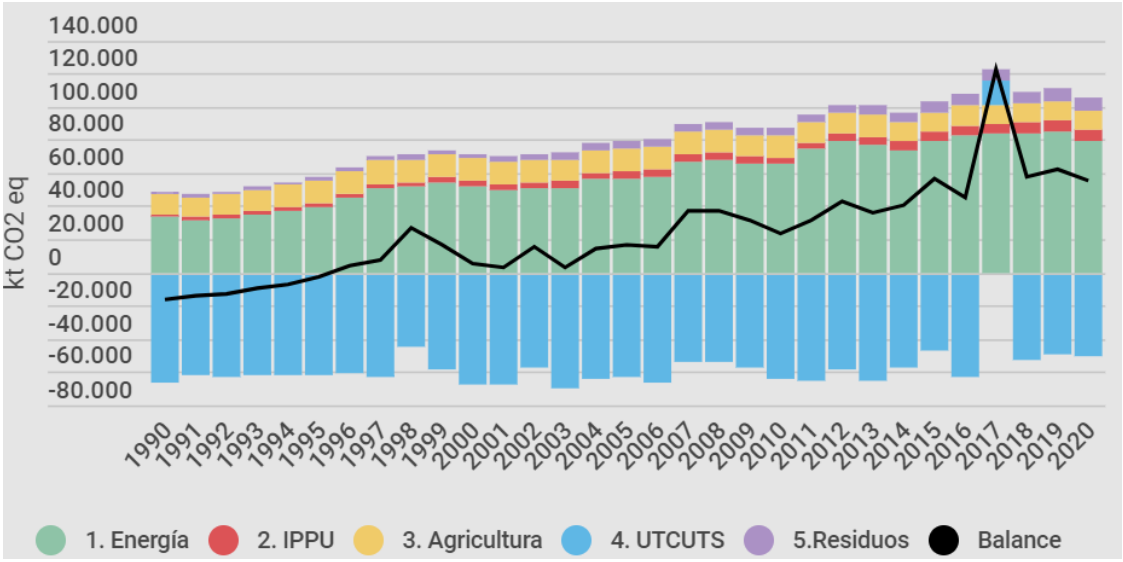


Source: Chile, Ministerio del Medio Ambiente (n.d.-a).
Note: 1. Energía (Energy); 2. IPPU = Procesos Industriales y Uso de los Productos (Industrial Processes and Product Use); 3. Agricultura (Agriculture); 4. UTCUTS = Uso de la tierra, cambio del uso de la tierra y silvicultura (Land-use, land-use change and forestry); 5. Residuos (Waste)

In 2020, Chile recorded a total of 105,552 kilotons of CO_2 equivalent ($ktCO_2e$) in GHG emissions, and the energy sector was responsible for 51 per cent of that total (79,724 $ktCO_2e$), mainly due to the consumption of fossil fuels for electricity generation and ground transportation.

Figure 1–2 below illustrates that GHG emissions from the energy sector increased 139 per cent between 1990 and 2020. This increase was due to the sustained growth in the country's energy consumption, including coal and natural gas consumption for electricity generation as well as liquid fuels such as diesel and gasoline for land transportation.

Figure 1–2. GHG balance ($ktCO_2e$) by sector, 1990–2020

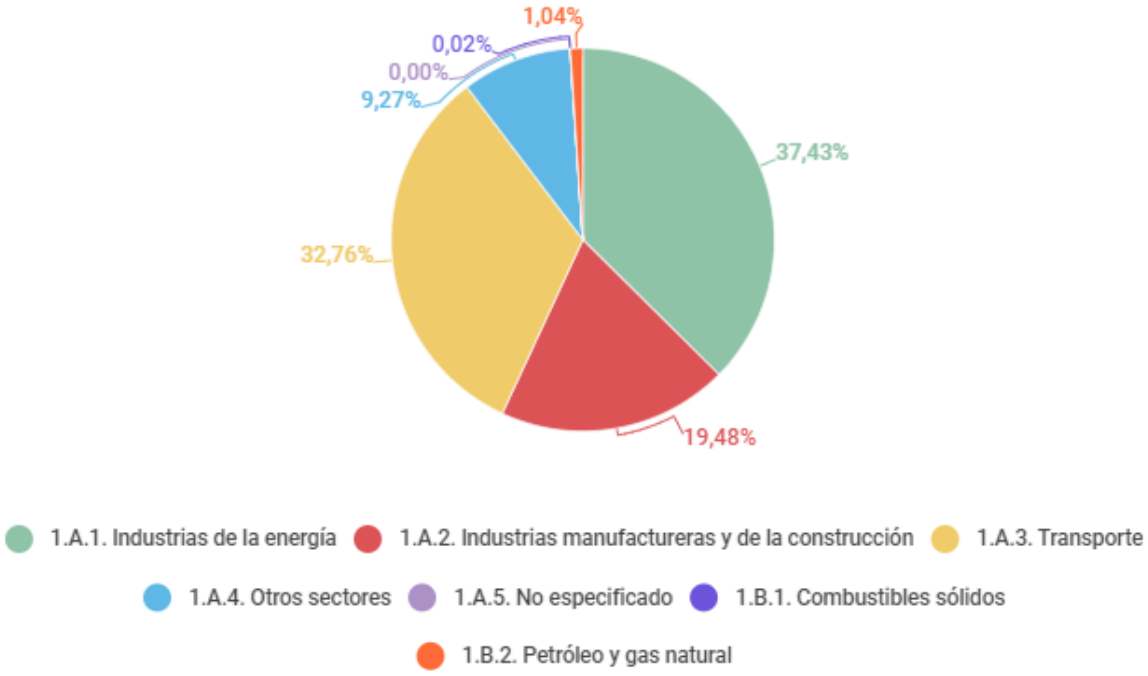


Source: Chile, Ministerio del Medio Ambiente (n.d.-a).
Note: 1. Energía (Energy); 2. IPPU = Procesos Industriales y Uso de los Productos (Industrial Processes and Product Use); 3. Agricultura (Agriculture); 4. UTCUTS = Uso de la tierra, cambio del uso de la tierra y silvicultura (Land-use, land-use change and forestry); 5. Residuos (Waste)

It is noteworthy that emissions have remained relatively stable since 2016. Some of the contributing factors for this trend are a decrease in coal consumption for electricity generation, the introduction of new renewable energy sources (solar, wind, geothermal), and the addition of new natural gas plants. However, a continued growth in the consumption of gasoline and diesel in land transportation has offset the decrease in coal consumption, thereby contributing to the sustained emissions levels. In 2020, emissions decreased compared to previous years due to the impact of the COVID-19 pandemic, especially in energy sources related to ground transportation and the commercial/institutional sectors.

Figure 1–3 below depicts total energy sector GHG emissions in Chile by subsector for 2020.

Figure 1–3. Energy sector GHG emissions in Chile (2020) by subsector



Source: Chile, Ministerio del Medio Ambiente (n.d.-b)
Note: 1.A.1. Industrias de la energía (Energy industries); 1.A.2. Industrias manufactureras y de la construcción (Manufacturing and construction industries); 1.A.3. Transporte (Transportation); 1.A.4. Otros sectores (Other sectors); 1.A.5. No especificado (Not specified); 1.B.1. Combustibles sólidos (Solid fuels); 1.B.2. Petróleo y gas natural (Oil and natural gas)

a. Emerging energy-related topics

Some of the emerging energy-related topics in the country are summarized below.

Electricity generation from renewable sources

The Chilean electric power market comprises three distinct and independent systems (Generadoras de Chile, n.d.):

- **The National electric system:** This system combines the former Central interconnected system and the Northern interconnected system.
- **Aysén system:** This system caters to the electricity needs of the Aysén del General Carlos Ibañez del Campo region.
- **Magallanes system:** This system serves the Magallanes and Chilean Antarctica region.

Chile has set a goal of reaching carbon neutrality by 2050, and power generation companies have formally committed to retiring fossil fuel thermal power plants by 2040. Among the priority

government programmes to support this goal is the promotion of energy storage and the Green Hydrogen Initiative, which is intended to make Chile a top global exporter of hydrogen by the year 2050. The Government of Chile has set a 2030 horizon for the target of achieving 70 per cent of the country's energy consumption from renewable power sources (International Trade Administration, 2023).

The Chilean Law 21.118 on net billing and distributed generation promotes self-power generation by residential communities of up to 300 kilowatts in nominal capacity (International Energy Agency, 2021).

Chile's electric power sector, including generation, transmission and distribution, is privately owned and operated by foreign and local companies.

In the context of electricity generation, it is noteworthy that in 2022 only four private companies collectively possessed over 50 per cent of total installed capacity in Chile: Enel (25 per cent), Grupo Matte (12 per cent), AES Corporation (10 per cent) and Engie (8 per cent) (Coordinador Eléctrico Nacional, 2023).

The following are some of the main milestones that position Chile as a strategic player in renewable energy sources:

- Historically, the main source of renewable energy in Chile has been hydroelectricity, but since 2007, with the entry of the first wind power plant in the Coquimbo region made up of 11 wind turbines that delivers energy to the grid, renewable energy generation has increased. In 2012, the first industrial-scale solar plant, called Calama Solar 3, began to inject renewable energy into the industrial areas of the Chuquicamata division (Generadoras de Chile, 2021).
- In 2017, "Cerro Pabellón" was inaugurated. It is the first commercial-scale geothermal power generation project in South America and the highest in the world, at 4,500 metres above sea level (Enel Chile, n.d.).
- In 2021, Chile began operating "Cerro Dominador", the first thermosolar concentration tower in Latin America. This is a 210 megawatt (MW) combined concentrated solar power and photovoltaic plant, located in the commune of María Elena. The cost of the project is estimated at USD 1 billion, and construction started in May 2014. The Chilean government, through Corporación de Fomento de la Producción (CORFO), provided USD 65 million of funding in 2019 for the concentrated solar power plant.[1] The Government also negotiated loans from the Inter-American Development Bank (IDB), the Clean Technology Fund, the German State-owned development bank (Kreditanstalt für Wiederaufbau [KfW]) and the European Union. In December 2019, a five-year power purchase agreement (PPA) was signed with Empresas Copec.
- After 16 years, renewable generation surpassed thermal generation in the first half of 2023, reaching a record share of 54 per cent of total generation. During the first six months of 2023, renewable energy sources produced the most electricity: solar generation displaced coal and hydroelectric generation, becoming the primary source of renewable generation in the country (Generadoras de Chile, 2023).

[1] Initially it was 20 million, but then the amounts were changing, 65 is the value updated to 2019. It should be noted that the project has different stages and now they are even working on incorporating the generation of green hydrogen in this generation plant. See more at https://www.corfo.cl/sites/Satellite?c=C_NoticiaNacional&cid=1476723533655&d=Touch&pagename=CorfoPortalPublico%2FC_NoticiaNacional%2FcorfoDetalleNoticiaNacionalWeb.

Electromobility

In terms of energy, in 2021, the transportation sector consumed 103,507 teracalories (Tcal), representing a 35.5 per cent share of total secondary energy demand. This energy was primarily derived from petroleum-based products (98.9 per cent), thus significantly impacting national GHG emissions, with this sector being responsible for 24 per cent of all emissions. Furthermore, 86.4 per cent of the sector's consumption is associated with land transportation. In this context, Chile has set goals to enhance energy efficiency in the transportation sector and reduce its GHG emissions intensity.

Some of the measures that have been developed to achieve these goals include the public–private agreement for electromobility. Its objective is to promote the advancement of electric mobility by coordinating various stakeholders in this ecosystem. In 2022, it engaged 142 institutions. Additionally, the National Electromobility Strategy sets a goal for 100 per cent of new light- and medium-duty vehicle sales to be zero-emission by 2035, along with 100 per cent of public transportation vehicle sales and 100 per cent of mobile machinery sales. Moreover, by 2050, 40 per cent of the total private vehicle fleet will be zero-emission, in addition to 100 per cent of public transportation (buses, taxis and shared vehicles). Currently, electromobility is strongly concentrated in Santiago and to a much lesser extent in other regions of the country.

The Ministry of Energy and the Ministry of Transportation and Telecommunications seek to establish a solid ecosystem for the deployment of electric mobility, while emphasizing the following pillars:

- **Promotion of charging infrastructure:** Create a robust public charging network for electric vehicles to enable users to travel throughout the country.
- **Public transportation and decentralization:** Electromobility should be expanded throughout the country, and its progress should be harmonized with different regions' requirements, taking into account the importance of strengthening public transportation to the country's decarbonization goals.
- **Education and training:** The challenge of moving towards zero-emissions in transportation requires job profiles that are appropriate for the new value chains that will be established, both for public and private transportation. To this end, it is necessary to have an increasing number of technicians trained in this area, while developing the new job profiles required in the sector.
- **Road safety:** Minimizing the risk of using electric vehicles is essential to provide safety and certainty to future users, operators and emergency personnel. Such measures are aimed at creating the necessary conditions to advance the safe deployment of electromobility.

The following are some of the main milestones that position Chile as a strategic player in electromobility (Gutiérrez, 2022):

- In 2018, the first national electric charging station was inaugurated in the municipality of Peñalolén. This charging station had 63 charging points for buses and also featured parking spaces with solar roofs. Additionally, 37 more charging points were installed in the municipality of Maipú.
- In 2018, the first 100 electric buses were introduced in Chile for public transportation, financed by Enel X. As of August 2021, the "RED" public transportation system in the Metropolitan Region of Chile had 1,443 environmentally friendly buses, more than 800 of which are electric.
- In 2021, the "Mi Taxi Eléctrico" programme was initiated by Chile's Energy Sustainability Agency – AgenciaSE – and the Ministry of Energy to offer tangible assistance to taxi owners transitioning to electric vehicles. During its initial phase, the programme successfully replaced 50 conventional combustion vehicles used as standard taxis with electric vehicles in the City of

Santiago. Moreover, it included the provision and installation of residential chargers at zero cost to beneficiaries (Agencia de Sostenibilidad Energética, 2024).

- In 2019, the first version of the Electromobility Accelerator was launched, backed by the Ministry of Energy and operated by AgenciaSE. This programme provides financial support for advisory services, encompassing knowledge acquisition, opportunity recognition and the tailored design of projects aimed at expediting electromobility initiatives within private companies. By the first half of 2021, the programme had offered its assistance to 20 entities, including two municipalities and two health-care service providers (Agencia de Sostenibilidad Energética, 2022).
- In 2021, the Electrologistics programme was launched by the Ministry of Transportation and Telecommunications (Proyecto Conecta Logística, 2023). This initiative is a public–private partnership dedicated to promoting the adoption of electric vans and trucks in urban logistics. It also serves to actively collect and share data to facilitate decision-making for those interested in pursuing electromobility projects within this sector.
- The Energy Efficiency Law, published on 13 February 2021, is among the enabling measures that present zero-emission transportation opportunities in Chile. The law grants the government authority to set energy efficiency standards and labelling for new light-, medium- and heavy-duty motor vehicles. The law grants the Ministry of Energy the authority to regulate the interoperability of the electric vehicle charging system to make it easier for electric vehicle users to access and connect to the charging network. The goal is to create integrated, homogeneous infrastructure to ensure free access to public chargers (Chile, Biblioteca del Congreso Nacional, 2021).
- As of August 2021, the country had a total of 818 chargers for public and private use, as well as charging hubs and charging stations for public transportation. Together, they total an installed capacity of 45.7 MW. Specifically, there are 297 public chargers, most of which are in the Metropolitan, Valparaíso and Biobío regions. Chile currently has public charging points in 92 municipalities, and there is at least one public charger in every region of the country (E-Mobility, 2023).

Green hydrogen

Chile has a unique opportunity to develop a competitive green hydrogen industry. That industry, powered by low-cost renewable electricity, can serve as both a local and export energy source to drive a sustainable economy. This opportunity can significantly enhance the national brand by adding green value to products made in Chile, reducing the transportation sector carbon footprint, and offering renewable energy sources to those in need. A tangible opportunity, for instance, would be to become the world's leading producer of green copper. In this manner, the country can foster spaces for innovation, boost local growth and employment, and create new enterprises with both local and global impacts. The National Green Hydrogen Strategy indicates that this opportunity could materialize into three distinct waves (Chile, Ministerio de Energía, 2020).

- **First wave:** This wave will consist of large-scale domestic consumption with established demand. Short-term opportunities include replacing imported ammonia with local production and replacing the grey hydrogen used in the country's refineries with green hydrogen. Subsequently, the use of hydrogen in passenger and long-haul heavy-duty transportation will become attractive.
- **Second wave:** In the second half of the decade, the country will see more transportation applications and the beginning of exports of green hydrogen. More competitive hydrogen production will displace liquid fuels in new applications in land transportation, such as in the

mining sector, and gaseous fuels in distribution networks. Simultaneously, there is a clear opportunity for the export of hydrogen and its derivatives to international markets.

- **Third wave:** In the long term, new export markets will open up and will need to be scaled. The maritime and aviation sectors can be decarbonized through hydrogen-derived fuels, on both local and international routes. Furthermore, as other countries decarbonize, export markets will expand.

The following are some of the main milestones that position Chile as a strategic player in the generation and use of green hydrogen:

- In 2023, the WB Board of Directors approved a USD 150 million loan to promote investment in green hydrogen projects in Chile, thereby accelerating the country's green growth and energy transition, as well as supporting its commitment to carbon neutrality by 2050. This is the WB's first loan to promote green hydrogen to support climate change mitigation efforts. The Chile Green Hydrogen Facility to Support a Green, Resilient and Inclusive Economic Development project will primarily benefit local communities where clean hydrogen will be produced and used. It will help create green jobs, stimulate the economy and decarbonize local industries. CORFO will implement the project by establishing a blended finance fund for green hydrogen projects and developing risk-mitigation instruments to improve financing conditions. Additionally, technical assistance will be provided to promote the development of this industry (World Bank, 2023b).
- In 2022, the Government of Chile and Toyota presented the first hydrogen fuel cell car approved for circulation in the country, which was also the first hydrogen fuel cell car in South America. The company brought three Mirai vehicles to Chile to start the homologation process. After the inspection process, the model obtained official homologation, making it the first in South America to be authorized to circulate in the country (InvestChile, 2022).
- In 2022, HIF Global's Haru Oni demonstration plant, located in Punta Arenas, southern Chile, began producing its first litres of e-fuel. It involves a team that includes Porsche, Enel Green Power, ENAP, Siemens Energy, Gasco and ExxonMobil. This plant generates fuel from wind energy, green hydrogen and recycled CO_2, making its emissions 90 per cent lower than those of fossil fuels (Energías Renovables, 2022).
- In 2021, CORFO announced the distribution of a USD 50 million financing fund for six green hydrogen projects to be developed in the country. The companies awarded were Enel, CAP, GNL Quintero, Engie, Air Liquide and Linde, with projects to be developed in the regions of Antofagasta, Valparaíso, Biobío and Magallanes (Arancibia, 2022).
- In 2021, AgenciaSE launched the first green hydrogen accelerator in the country. The accelerator was created under the framework of the National Hydrogen Strategy, whose main objective is to promote the consumption of green hydrogen by the local industry by focusing on green hydrogen production or consumption projects (Agencia de Sostenibilidad Energética, 2021). To achieve this, the following objectives were proposed.
  - Accelerate decisions to implement local hydrogen consumption projects.
  - Provide co-financing to support the development of advanced feasibility studies.
  - Provide co-financing for project implementation.

Energy storage

The implementation of energy storage systems such as batteries has become crucial for the integration of intermittent renewable energy sources in the Chilean power grid. Energy storage projects have been carried out to improve supply reliability and grid stability.

Storage systems have gained significant importance in the electricity sector, given their potential to serve as the ideal complement to Chile's abundant renewable energy resources, especially variable renewable energy sources such as sunlight, wind, water or the sea. Chile has the potential for over 190 gigawatts (GW) of wind energy and more than 1,100 GW of solar energy. These sources are inherently variable as there is no sunlight at night and the availability of wind is dependent on the weather conditions. For this reason, electricity storage has the potential to play a fundamental role in providing continuous and reliable renewable electric energy, thereby contributing to the decarbonization of the country's economy and serving as a key ally in the energy transition of the electricity generation sector, thus helping to advance towards a more sustainable Chile (Generadoras de Chile, 2021).

In January 2023, the Government of Chile announced a tender for electrical energy storage systems, with an investment of USD 2 billion for two 2 GW storage systems for four hours of operation per day (Peña, 2023).

Energy efficiency

Over the years, Chile has systematically focused on the implementation of energy efficiency programmes in economic sectors that consume a large amount of energy. These efforts are led by the Ministry of Energy and the Chilean Energy Sustainability Agency.

Chile's first Energy Efficiency Law was enacted in February 2021 and is intended to foster the rational and efficient use of resources and covers practically all the country's energy consumption.

The central elements of the Energy Efficiency Law are as follows:

- **Institutionalizing energy efficiency:** The Ministry of Energy prepares a National Energy Efficiency Plan every five years, and it is established that the first plan must include an energy intensity reduction goal of at least 10 per cent by 2030 compared to 2019 levels. In addition, it must include a goal for consumers with energy management capacity, consisting of an average reduction in their energy intensity of at least 4 per cent in the period covered by the plan.
- **Energy management systems for large consumers:** Large consumers account for more than one third of the energy consumed in the country and must actively manage their energy. For this purpose, the Ministry of Energy identifies consumers with energy management capacity, and they must implement an energy management system. Additionally, they must report annually on their energy consumption and other indicators, and the Ministry prepares a public report based on the reported data.
- **Energy rating of buildings:** The law establishes that buildings (homes and buildings) must have an energy rating (labelling) to obtain final or definitive municipal approval.
- **Vehicle efficiency standards:** Energy efficiency standards are set for new vehicles. Importers and representatives of each vehicle brand marketed in Chile are responsible for compliance. The Ministry of Energy regulates the interoperability of the electric vehicle charging system to facilitate access and connections to the charging network, thus enabling harmonious development and ensuring free access to public chargers.
- **Hydrogen regulations:** Hydrogen is expressly declared as a fuel, and the Ministry of Energy is empowered to regulate it and treat it as an energy resource.
- **Energy management in the public sector:** The law establishes obligations of State agencies for the proper use of energy. The Ministry of Energy prepares annual reports based on the information received.

The Energy Efficiency Action Plan (Plan de Acción de Eficiencia Energética (PAEE)) was published in 2013 with the aim of serving as a guide for the public and private sectors to direct their actions and increase energy efficiency in their respective areas of operation. Its goal was to achieve

a 12 per cent reduction in projected energy demand by the year 2020, compared to the year 2010. The PAEE included a total of 32 measures, divided into six sectors: industrial and mining, transportation, building, appliances, firewood, and cross-cutting measures.

By 2020, all 32 measures proposed in the PAEE had been implemented. As a result, in 2019, there was a final consumption energy savings of 29,366 Tcal, equivalent to a 9 per cent reduction in projected energy demand. This, in turn, represents a reduction of 8.7 million tCO_2e, which is comparable to planting over 500,000 hectares of native forest or having more than 5 million vehicles not in circulation for a year.

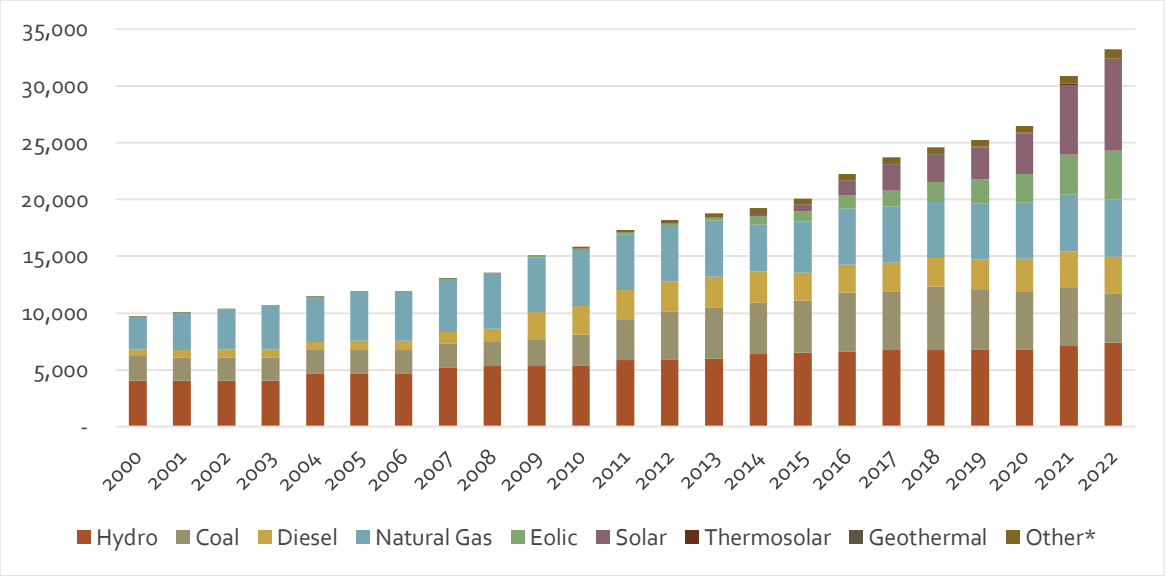
b. Energy matrix

In accordance with data published by the National Electric Coordinator (Coordinador Eléctrico Nacional), the renewable energy share in the Chilean installed capacity and electricity generation for 2022 was 59 per cent and 55 per cent, respectively (including hydropower).

In Figure 1–4 and Figure 1–5 below, the trends over the years can be observed for both installed capacity (MW) and electricity generation (GWh/year).

Figure 1–4. Installed capacity (MW)

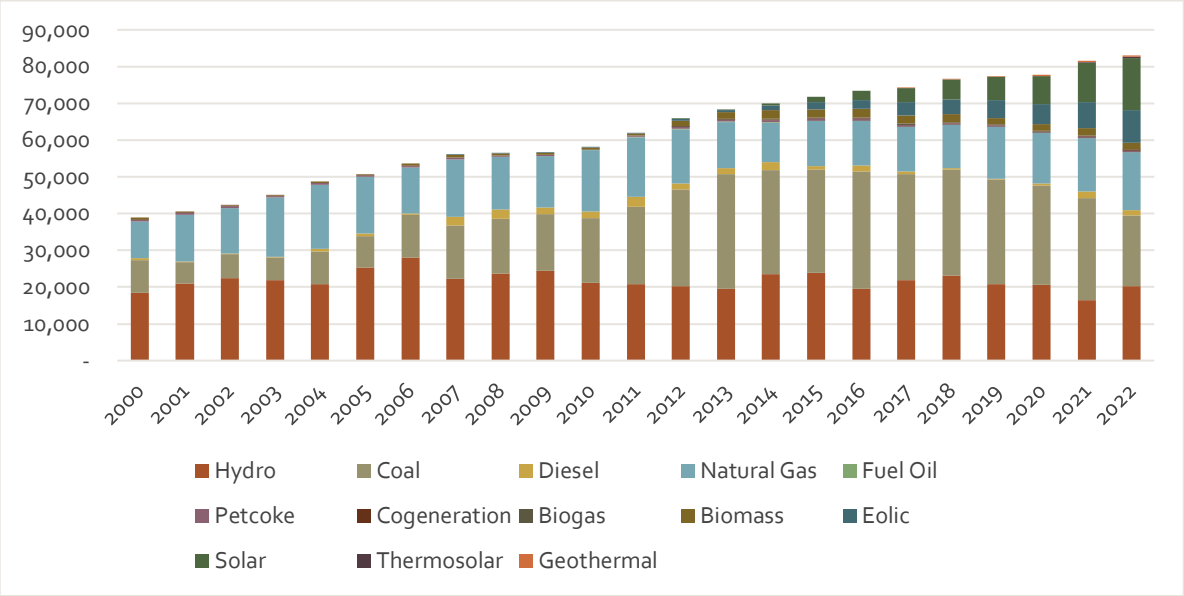
Unit: MW



Source: https://www.coordinador.cl/wp-content/uploads/2024/02/CEN-hist_cap_inst_por_tecnologia.xlsx
Note: Other* data encompasses the combined capacity of both "*Sistema Interconectado Central* and "*Sistema Interconectado del Norte Grande*" for years preceding 2017.

Figure 1–5. Electricity generation

Unit: GWh



Source: https://www.coordinador.cl/wp-content/uploads/2023/01/CEN-hist_gen_de_energia_por_tecnologia.xlsx.

As of December 2022, the National Electric Coordinator reported an installed power capacity of 33,218 MW, a 16 per cent increase from the previous year. Of this total, 7,908 MW were from solar, a 22 per cent increase from 2021, and 5,328 MW were from wind, a 30 per cent increase from the previous year.

In 2022, the main energy sources for electric power generation were hydro (24 per cent), natural gas (19 per cent), solar (17 per cent) and wind (11 per cent).

c. Sustainable development in the energy sector and related policies

Table 1–2. Sustainable energy policies and strategies

STRATEGY	STATUS	BRIEF DESCRIPTION
National Energy Policy (Energy Efficiency Law)	In force (2021)	The Energy Efficiency Law (21305) of Chile was approved in February 2021. Its main objective is to reduce energy consumption and improve energy efficiency in the three sectors that account for most of the country's energy consumption: transportation (37 per cent), industry and mining (40 per cent), and the residential, public and commercial sectors (23 per cent). The main implications of the law are as follows: • The law establishes that the Ministry of Energy will prepare a National Energy Efficiency Plan every five years. It will include participatory processes and will be submitted to the Council of Ministers for Sustainability. • Large energy consumers, which account for more than one third of the energy consumed in the country, are mandated to actively manage their energy. • All new-build dwellings, public buildings, commercial buildings and office buildings must have an energy rating in order to obtain the final or definitive municipal approval.

STRATEGY	STATUS	BRIEF DESCRIPTION
		• The law mandates the establishment of energy efficiency standards for new vehicles. Importers and representatives of each brand of vehicle marketed in Chile are responsible for compliance. It also generates an additional incentive for electric and zero-emission vehicles.
Updated nationally determined contribution (NDC)	Submitted (2020)	Chile submitted its first NDC in 2015 and an update in 2020 (Chile, 2020). The NDC includes the following key elements: **Mitigation targets**: Chile's updated NDC aims to reduce GHG emissions to 95 $MtCO_{2e}$ by 2030, with a total emissions budget of no more than 1,100 $MtCO_{2e}$ in the 2020-2030 period. The goal is to reach GHG neutrality by 2050. **Adaptation measures**: Chile will contribute to the global target of adapting, reducing vulnerability, strengthening resilience, and increasing the country's adaptive capacity (in particular increasing water security and considering nature-based solutions), in order to protect people, livelihoods and ecosystems while taking into account the urgent and immediate needs of the country based on the best science available. Chile's contribution to adaptation is focused on two areas: • Climate change policies, strategies and plans • Areas of greatest urgency in climate adaptation actions **Renewable energy**: One of the measures that Chile is already implementing is the reduction of thermal generation plants by adopting renewable energy, thus eliminating 5,500 MW by 2040 in the carbon-neutral scenario. The government has also implemented programmes to promote the use of renewable energy sources such as green hydrogen and the promotion of energy storage. **Forest conservation and reforestation**: Chile is committed to the sustainable management and recovery of 200,000 hectares of native forests, representing GHG captures of around 0.9 to 1.2 $MtCO_2e$ annually by 2030. Chile is also committed to afforest 200,000 hectares, of which at least 100,000 hectares will be permanent forest cover, with at least 70,000 hectares of native species. Recovery and afforestation will be undertaken primarily in land suitable for forest growth and/or priority areas for conservation and will represent carbon captures of between 3.0 and 3.4 $MtCO_2e$ annually by 2030. By 2030, Chile will reduce forestry sector emissions associated with the degradation and deforestation of native forest by 25 per cent compared to average emissions in the 2001–2013 period. **International support**: Compared to the 2015 NDC, which committed Chile to annual absolute emission levels of about 123 $MtCO_2e$ by 2030 (equivalent to the unconditional intensity target of a 30 per cent reduction by 2030 compared to 2007 indicator), this new contribution represents a maximum annual emissions level of up to 95 $MtCO_2e$ by 2030. It is an unconditional target – that is, it is not subject to qualifying external conditions (grants). The country has also participated in international initiatives, such as the NDC Support Programme, to receive support for its climate goals.
National adaptation plan	Published (2021)	Chile committed not only to reducing the intensity of its CO_2 emissions by at least 30 per cent by 2030 and promoting non-conventional renewable energy sources by promoting an energy

STRATEGY	STATUS	BRIEF DESCRIPTION
		efficiency law, but also to defining four other pillars of climate action in addition to mitigation. These pillars are adaptation, capacity-building, development and transfer of technologies, and financing. The action plan has 16 specific objectives and 30 action lines that are materialized in 96 measures, divided into four areas of action: adaptation, mitigation, means of implementation, and management of climate change at the regional and communal levels.
Long-term climate strategy	Submitted (2021)	Chile was the first Latin American country to present a long-term climate strategy to the United Nations Framework Convention on Climate Change, doing so at COP26 in Glasgow. The strategy consists of over 400 concrete measures to reduce emissions, most prominently the supply of 80 per cent of the energy mix from renewables by 2030 and 65 per cent by 2025 (Chile, 2021). It also includes goals and targets in other sectors such as reducing emissions from industry and mining by 70 per cent and emissions from transport by 40 per cent by 2050. It also – for the first time – includes specific CO_2 emission targets and budgets for each individual sector. All these targets are now legally binding in Chile's Climate Change Framework Law.
National Energy Policy (Política Energética Nacional)	Published (2022)	Chile's Energy Policy establishes a shared idea of the future, whereby the State and society collaborate to build a path forward for the energy sector, taking into consideration commitments, desires and challenges of the stakeholders. The recent update of the energy policy focuses on the energy transition that the country is undergoing, the diversity of an increasingly active society, and their will to respond to the needs that energy is capable of solving (Chile, Ministerio de Energía, 2022b). This document outlines 18 general objectives that define the commitments of the Government of Chile: • Emission-free energy • Universal and equitable access • Sustainable cities • Sustainable transportation • Citizen education in energy • Inclusive economic development • More human capital • Social and environmental sustainability in strategic development • Efficient and sustainable industry • Local development and decentralization • Reliable and quality energy supply • Electricity system for the empowerment of people • Participatory public policies • Balanced insertion of the energy sector in territories • Information for the energy transition • Coordination between institutions • Institutionality and energy governance • Interculturality and permanent dialogue

STRATEGY	STATUS	BRIEF DESCRIPTION
Energy Agenda 2022–2026 (Agenda de Energía 2022–2026)	Published (2022)	For three administrations, the Ministry of Energy has been building its agenda of commitments and actions for the next four years of government through participatory processes. The latest agenda (Chile, Ministerio de Energía, 2022a) is focused on addressing immediate, short-term needs and on actions that will be carried out during the current Administration's (i.e. that of Gabriel Boric) tenure and that will enable coherent responses to medium- and long-term needs, with a State vision. This agenda presents the following pillars: • Equitable access to quality energy • Clean energy matrix • Secure and resilient energy development • Just energy transition and sustainable infrastructure • Energy decentralization • Citizen empowerment and democratization of energy • Innovation and inclusive economic growth • Modernization of public management
National Energy Efficiency Plan 2022–2026 (Plan Nacional de Eficiencia Energética 2022–2026)	Published (2021)	The National Energy Efficiency Plan provides a strategic framework for the development of energy efficiency in Chile, which will materialize the potential for energy savings that will make it possible to achieve carbon neutrality by 2050. This outcome is in line with the sustainability policies that the Ministry of Energy and the State in general have developed so far. The plan has been divided into four sectors, these being productive sectors, transportation, buildings and citizenship (Chile, Ministerio de Energía, 2021). Each of these sectors has a defined set of measures and specific goals to be achieved.
National Electromobility Strategy (Estrategia Nacional de Electromovilidad)	Published (2022)	This Strategy aims to establish strategic guidelines as well as specific measures and goals that will enable the accelerated and sustainable development of electric transportation from an integral, global and participatory perspective (Chile, Ministerio de Energía, Ministerio de Transportes y Telecomunicaciones and Ministerio del Medio Ambiente, 2022). There are four strategic guidelines: • Sustainable transportation and financing • Freight infrastructure and regulation • Research and human capital • Dissemination, information and articulation
National Green Hydrogen Strategy (Estrategia Nacional de Hidrógeno Verde)	Published (2020)	The Strategy establishes the following strategic guidelines (Chile, Ministerio de Energía, 2020): • The State will be a facilitator, coordinator and promoter of the mission to establish a new hydrogen industry with multisectoral efforts. • The development of the hydrogen industry will be consistent with its social and environmental surroundings, incorporating best practices and dialogue. • Hydrogen will enable a new Chilean export economy based on clean energy and low-carbon footprint products. • Chile is committed to the transition to carbon neutrality, in which hydrogen will play a leading role.

STRATEGY	STATUS	BRIEF DESCRIPTION
		• The projects and the industry of this clean fuel will generate poles of investment, innovation and local activity. • International openness will develop the national and global green hydrogen economy at the speed the planet requires.
Climate Change Framework Law	In force (2022)	The Climate Change Framework Law (21455) was approved in May 2022, and its main objective is to address the challenges posed by climate change, with the aim of achieving GHG emissions neutrality by 2050 (Chile, Biblioteca del Congreso Nacional, 2022). To achieve this mitigation goal, the law establishes management instruments at the national, regional and local levels; it determines the environmental institutional framework for climate change, assigning specific functions and responsibilities to each of the national, regional and collaborating bodies that compose it, with the Ministry of the Environment being the national authority in this matter. Additionally, it creates a National System of Access to Information and Citizen Participation on Climate Change that will be administered and coordinated by the Ministry of the Environment and establishes guidelines and financial mechanisms to address climate change. It also indicates that the Ministry of Public Works must prepare strategic plans for water resources in basins, to contribute to water management, identify water gaps of surface and groundwater, and establish the water balance and its projections. Each river basin in the country must have a strategic water resources plan that must be made public, be reviewed every five years, and be updated every 10 years. Finally, the law makes a series of amendments to different legal bodies to adapt the current legal system to these new regulations.

d. Institutional roles and responsibilities in the energy sector

Ministry of Energy: The Ministry of Energy is responsible for developing and implementing energy policies and strategies in Chile. It is also responsible for promoting the use of renewable energy sources, improving energy efficiency and reducing GHG emissions.

Superintendency of Electricity and Fuels: The Superintendency is responsible for regulating and supervising the electricity and fuel markets in Chile. It ensures that companies comply with technical and safety standards and promotes competition in the sector.

National Energy Commission (Comisión Nacional de Energía – CNE): The CNE is responsible for promoting the development of the energy sector in Chile. It provides technical advice to the government on energy policy and monitors the electricity and fuel markets.

National Electric Coordinator: The National Electric Coordinator is responsible for coordinating and ensuring the reliable operation of the national electricity system. It manages the dispatch of electricity, monitors grid stability and promotes efficient electricity market operation.

Energy Sustainability Agency (or AgenciaSE): AgenciaSE is a public–private foundation with the mission to promote energy sustainability and efficiency in Chile. It works towards the implementation of energy efficiency measures, the promotion of renewable energy sources and the

reduction of GHG emissions. It collaborates with various stakeholders, including government entities, private companies and civil society, to achieve its objectives.

e. GCF energy sector portfolio

National designated authority (NDA). The NDA in Chile is the Ministry of Finance.

AEs. Chile has one GCF accredited national direct access entity namely Finanzas y Negocios S.A.Corredores de Bolsa (FYNSA). In addition, Chile has developed or is developing projects in the energy sector with the GCF AEs presented in Table 1–3.

Table 1–3. AEs with approved FPs in Chile

NAME OF AE	DATE OF ACCREDITATION	ACCREDITATION LEVEL
MUFG_Bank	6 July 2017	International
Corporación Andina de Fomento (CAF)	7 July 2015	Direct (regional)
Inter-American Development Bank (IDB)	9 July 2015	International

Readiness and project preparation in the energy sector. Chile has received 11 RPSP grants. However, none of the grants directly supported the energy sector.

Funding proposals (FP) in the energy sector. Four FPs have been approved in the energy sector for a total of USD 409.5 million in GCF financing, of which two are single-country projects and two are multi-country projects (Table 1–4).

Chile has no concept notes and has one FP in the pipeline for the energy sector.

Table 1–4. Funded activity portfolio in the energy sector

PROJECT NUMBER	NAME	PUBLIC/ PRIVATE	SECTORAL GUIDE			AE	APPROVAL DATE/STATUS	GCF ENERGY INVESTMENTS (USDM)	TOTAL GCF BUDGET (USDM)
			Energy generation and access	Energy efficiency	Cities, buildings, and urban systems				
FP017	Climate action and solar energy development programme in the Tarapacá Region in Chile	Private	x			Corporación Andina de Fomento	2016 / Completed	181	181
FP115	Espejo de Tarapacá	Private	x			MUFG_Bank	2019 / Post-first disbursement	60	60
FP151	Global Subnational Climate Fund (SnCF Global) – Technical Assistance (TA) Facility	Private	x	x	x	IUCN	2020 / Post-first disbursement	13,875	18.5
FP152	Global Subnational Climate Fund (SnCF Global) – Equity	Private	x	x	x	Pegasus Capital Advisors	2020 / Post-first disbursement	112.5	150

Source: IEU DataLab

B. KEY FINDINGS

1. CONTRIBUTION TO ACHIEVING CLIMATE GOALS IN CHILE THROUGH GCF ENERGY SECTOR PROJECTS

a. Likelihood of GCF energy sector projects achieving expected results

Based on a comprehensive analysis of interview results and a desk review, the prospects of achieving the expected results (outputs) for GCF energy sector projects in Chile are currently deemed to be moderate. One of the reasons for this is that the energy sector is fast changing, and the market is affected by factors that are beyond the control of project teams. For example, FP115 will not reach completion due to a change in market conditions. The commercial conditions for the purchase and sale of energy in the Chilean spot market have changed between the project formulation period and the implementation period, and they are less favourable in the implementation period in terms of uncertainty in energy purchase and sale prices. This is due to a lack of transmission infrastructure at the national level, which has generated distortions in marginal electricity prices, thus affecting mainly solar companies that sell or buy energy in the spot market. This market distortion has hindered the availability of a PPA, which is necessary for the project's cash flow. Interviewees have mentioned that the gap in time between application of FP and project implementation after the approval is very significant for dynamic markets such as energy.

On the other hand, project FP017 has been successfully completed, in spite of problems generated by the COVID-19 pandemic during the project implementation period.

As for the multi-country projects in the energy sector (FP149, FP151, FP152 and FP189), it is too early to assess the achievement of expected results since these are in the initial implementation stage and no activities have started in Chile yet.

Based on the above findings, and considering the time taken by the GCF's bureaucratic processes, the projects have not been able to generate a relevant impact on the market. On the other hand, it should be noted that the GCF has a greater capacity for impact on issues such as improving the incorporation of the electrical transmission sector or incipient industries such as energy storage and/or the creation of internal demand for green hydrogen that could be produced in the future.

b. Changes in the practices of AEs and other stakeholders in Chile, triggered by GCF energy sector projects

The findings indicate that the NDA in Chile has undergone a recent change in its work team since 2022. This presents an opportunity because the NDA have detected improvement actions that they can implement in the short term. The NDA is actively engaged in updating the country programme (CP) and aims to expand its pool of national AEs, including at least one public institution and one national bank.

Notably, the current NDA work team has demonstrated commendable progress in building knowledge and interest in the national energy sector. This development will prove advantageous in the near future as it will enable the Ministry of Finance to better understand the challenges and needs of projects in the energy sector. In its role as the NDA for the GCF, the Ministry of Finance will be better equipped to adopt a critical and well-informed perspective on energy-related matters.

Although there is still need for investments and developments terms of infrastructure, electricity transmission, storage and district energy, Chile's energy market is already well developed. It is primarily driven by the private sector and is subject to effective regulation by the public sector and existing access to financing through various financial instruments available in the market. As a

result, the potential impacts of the GCF on other participants in the energy sector are not regarded as highly significant, in contrast to scenarios in countries with less advanced energy markets. The Ministry of Energy and the Ministry of Environment are the key drivers behind these efforts. It is noteworthy that Chile has recently enacted both an Energy Efficiency Law (2021) and a Climate Change Law (2022), thus reflecting the country's commitment to addressing these critical issues.

c. Co-benefits of GCF energy sector projects in Chile

Regarding implemented and ongoing projects, a range of environmental, social and economic co-benefits have been observed, as exemplified in the following projects:

- **FP017 – Climate action and solar energy development programme in the Tarapacá Region in Chile.** This project is a 143 MW solar park that will supply a low-cost, clean and renewable alternative to coal-fired or LNG-generated power. Notably, this project has had significant economic impacts, primarily through jobs creation during the construction phase. The engineering, procurement and construction company, Biosar Chile SpA, employed a range of skilled, semi-skilled, and unskilled labourers, totalling 220 workers until 2020, thus enhancing local employment opportunities. In terms of social aspects, the project has actively pursued collaborative initiatives with academics and vocational centres to promote renewable energy opportunities. Additionally, a gender mainstreaming plan was implemented to foster gender equality and enable women to access equal opportunities in the project's workforce.
- **FP115 – Espejo de Tarapacá.** The objective of this project is to provide stable, 24-hour baseload energy and to solve the intermittency of renewable energy through a combination of pumped storage hydroelectric energy and a solar power plant. Although this project will not be implemented, in its application stage it was designed to yield crucial environmental co-benefits. Specifically, it aimed to provide a stable, large-scale source of zero-emissions energy, thus contributing to the overall cleanliness of Chile's energy sector and enhancing the resilience of the energy system against climate change. Moreover, the project had anticipated generating significant economic co-benefits within the Tarapacá Region, where it was intended to be located. This would have been achieved through the employment of diverse skilled, semi-skilled and unskilled workers during both the construction and operational phases of the project. Social co-benefits were also anticipated as the project established collaboration agreements with the local vulnerable community, thereby ensuring their active involvement and engagement throughout the development, construction and operational stages of the plant.

d. Adaptation of GCF practices in energy sector interventions and investments in Chile

One of the highlighted features of the GCF's financing is its approach to environmental and social safeguards as well as considerations on gender and Indigenous Peoples for the whole project cycle. An FP must include the following:

- A gender assessment along with environmental and social assessments
- A project-level gender action plan

For example, in the 2020 annual performance report (APR) for FP017, the following outputs associated with the project's logical framework were reported.

- **Output 3: Stakeholder engagement.** An Atacama stakeholder map was developed that identifies three kinds of stakeholders: local, Indigenous and regional. In addition, a socio-community risk map was prepared that identifies social issues related to the project, including positive and negative externalities.

- **Output 4: Improve women's participation in the project through a gender mainstreaming plan.** The gender mainstreaming plan was developed and included the objective to promote gender equality and the participation of women during the construction and operational phases of the project, which covered the period from the start of construction in June 2019 to the operational phase. The plan includes gender strategies and policies, the identification of key stakeholders, awareness-raising, capacity-building and reporting on gender.
- **Output 5: Develop and implement local capacity-building approach.** A local capacity-building approach was developed, and the project considered working with the contractor and colleges to provide training and development opportunities and promote an internship/scholarship programme aimed at local female students.

Due to the requirements and monitoring activities of the GCF, it is possible to define and supervise activities related to gender issues, Indigenous Peoples, and environmental and social safeguards for GCF-funded activities. This monitoring may not be carried out for other projects financed by the private sector or other public entities.

The GCF reporting requirements on these issues serve to provide information on the current status, progress and planning of activities to achieve the objectives proposed at the beginning of the project.

e. Major positive and negative elements contributing or hindering the achievement of project results in Chile

Based on the results of the desk review, the evaluation of the two single-country projects, FP017 and FP115, revealed both positive and negative aspects, as follows.

i. Positive

Projects are aligned with the country's energy transition needs and tackle challenges related to climate change. Consequently, the Government of Chile has extended political support to the implementation of GCF projects.

Projects promote renewable energy sources and can help solve other problems associated with the efficient use of resources, such as access to drinking water.

Projects can be scaled up and replicated if the results obtained allow and can also help to validate novel technologies or innovative processes incorporated into the design and execution stages.

The Ministry of Finance, acting as the NDA for the GCF, has had the opportunity to enhance its capacity and expertise in climate change, renewable energy and energy efficiency.

ii. Negative

Projects are highly vulnerable to changing market conditions, which increases as the gap in time between project application and project execution increases. This can lead to project implementation delays and, in some cases, even non-implementation of the project.

One interviewee indicated that the GCF processes to make the necessary changes to ensure the sustainability of a project are very slow and bureaucratic.

2. Suitability and effectiveness of GCF Secretariat support in the approval and implementation process of energy sector projects

a. GCF approach to project origination and its alignment with the needs of the energy sector in Chile

The GCF offers substantial resources for project origination, yet it can be challenging for potential applicants to access relevant information, particularly for applicants without prior experience with

GCF projects. According to interviewees, when applicants seek guidance or clarification during project formulation, the responses they receive tend to be generic, often directing them to review various documents. Consequently, the current process lacks user-friendliness, adding complexity to project origination and requiring applicants to invest significant hours of work. This, in turn, may discourage some from pursuing projects through the GCF financing mechanism.

Moreover, the dynamic nature of the energy sector and evolving market conditions create a time-sensitive environment. However, the duration between application and the first disbursement of funds can be lengthy. Interviewees emphasized the need for shorter timelines or greater flexibility to adjust projects in response to market changes that could either positively or negatively impact project implementation.

The CP serves as a highly valuable tool for Chile by bringing the Ministry of Finance, the Ministry of Environment and the Ministry of Foreign Affairs together to lead the development process for climate actions in the country. In addition, through its participatory process, it gathers together other key stakeholders such as the Climate Change Office, the Sustainability and Climate Change Agency, the Council of Ministers for Sustainability, the National Council for Sustainability, CORFO and the private sector. It also facilitates the prioritization of the most relevant activities and projects aligned with the country's objectives, and this is a country decision, not only a ministerial decision.

The CP offers an opportunity to envision the country's future trajectory, which should be shared with key stakeholders in the energy sector such as the CNE and the Chilean Association for Renewable Energies (ACERA). Such coordinated work between institutions aims for the development of a project pipeline that could potentially receive financing in the future. At present, not all projects developed in Chile exhibit consistent long-term coherence, indicating a need for enhanced coordination and information dissemination. It is worth noting that Chile lacks a single national entity responsible for coordinating all activities related to climate change financing. As a result, the coordination challenge is substantial, with prominent involvement from the Ministry of Energy, the Ministry of the Environment and CORFO.

The majority of interviewees expressed that the procedures and timelines associated with the GCF are not well suited to the Chilean private sector, which operates with faster processes and lower bureaucratic burdens. Moreover, they highlighted that the absence of a regional office sometimes results in limited contact hours with GCF professionals and that the language in which documents should be prepared was a challenge since they were not in the local language.

b. Work of the GCF with relevant energy sector stakeholders, including the network of AEs and executing entities

The majority of interviewees acknowledged their lack of knowledge regarding the stakeholders with whom the GCF collaborates, resulting in their inability to respond to this inquiry. No mention was made in the interviews of any collaborative work associated with the network of AEs and executing entities.

Nevertheless, from a national point of view, it has been noted that the NDA engages with a significant group of key public sector stakeholders, with the exception of regulatory bodies in the energy sector such as CNE. As for the private sector, there are still certain actors that need to be actively involved in GCF processes, including organizations such as ACERA and the Energy Poverty Network. These stakeholders play pivotal roles in advancing initiatives related to climate change and energy, and their engagement would further strengthen the effectiveness and impacts of GCF projects in Chile.

c. Compliance of GCF energy sector projects with GCF environmental and social safeguards

The findings from both interviews and the desk review affirm that both single-country projects, FP017 and FP115, fully meet all the requirements stipulated by the GCF during the application process and throughout the project implementation stage.

d. Assessment of the human capacity of the GCF Secretariat to support energy sector projects throughout their life cycle

According to the feedback from interviewees, both in the application process and during project operation, the communication process and channels of the GCF are perceived as inefficient. A notable concern raised by the interviewees is the inconsistency in criteria applied by different GCF specialists, potentially impacting the robustness of processes and diminishing interest among applicants who have had unfavourable experiences.

A few interviewees noted that the GCF appears to be understaffed, which may contribute to the challenges experienced in communication and support.

e. GCF sectoral guidance in the energy sector

The majority of interviewees expressed limited awareness regarding the content and existence of a sectoral guide relating to the energy sector.

f. Policy and governance framework of the GCF in the energy sector

A significant number of interviewees demonstrated limited familiarity with the policy and governance framework of the GCF. They emphasized the complexities within governance frameworks, including challenges related to decision-making processes.

g. Comparison of GCF energy sector investment cost-effectiveness with those of the private sector and/or other public finance institutions or development agencies

Several interviewees emphasized that GCF investments in the energy sector are undeniably cost-effective in terms of financial conditions. However, it was noted that the transaction costs associated with bureaucratic processes can be considerable. The extensive documentation requirements and protracted question-and-answer phase often led to inefficiencies, by revisiting aspects that had previously been agreed upon during earlier stages.

In general, interviewees indicated that the application process can be financially burdensome, particularly if the project is not ultimately awarded funding. The lack of clear and well defined reasons for rejection from the outset may deter applicants from attempting to reapply in the future. Therefore, providing transparent and concise feedback on rejected proposals would be valuable in facilitating a more efficient and informed approach to subsequent applications.

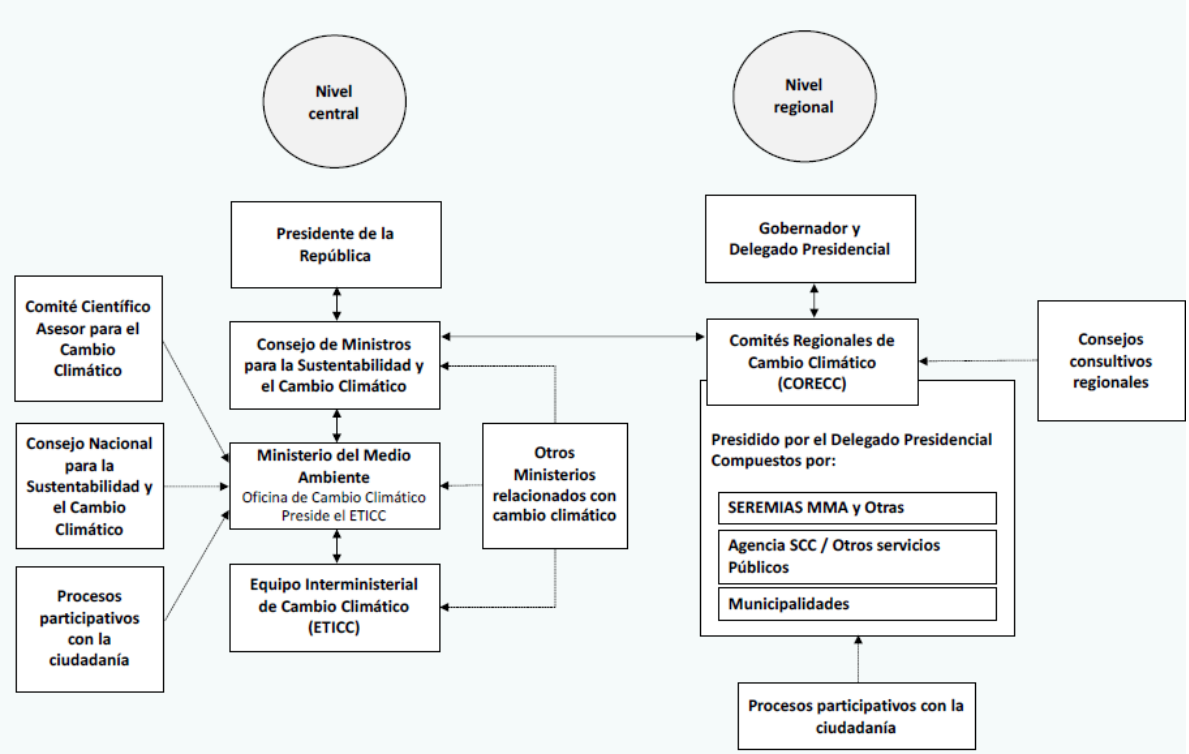
3. Sustainability of the results and approaches of GCF interventions in the context of global and Chilean energy sector specifics

a. GCF approach in ensuring the sustainability and socioeconomic co-benefits of energy sector investments

The GCF employs a comprehensive approach to ensure sustainability and socioeconomic co-benefits in energy sector investments. This approach is multifaceted and includes the following key elements:

- **Project selection criteria:** The GCF carefully selects energy sector projects that align with its sustainability goals and objectives. These criteria typically prioritize projects that contribute to reducing GHG emissions, enhancing resilience to climate change and promoting sustainable development. For FP017, the expected GHG emissions reduction over 20 years was 3,697,439 tCO_2e, and for FP115 the expected lifetime emission reduction was 11,000,000 tCO_2e.
- **Holistic assessment:** The GCF conducts thorough assessments of proposed energy projects to evaluate their potential impacts on the environment, society and the economy. This includes factors such as carbon emission reductions, renewable energy adoption, energy efficiency improvements and jobs creation. For FP017, the following sustainable development potential is described in the FP.
  - **Economic impact in the vicinity of the project:** Although the project only estimated the need for about 20 permanent employees for routine operation and maintenance support, it also contracted an engineering, procurement and construction company for the development phase of the project, which in the implementation phase hired temporary workers (in the skilled, semi-skilled and unskilled categories). In addition to the direct economic benefits derived from the project, during the construction period of approximately one-year, economic opportunities were identified in the vicinity of the project (in the towns of Matilla and Pica), such as the provision of goods, services, hotel rooms and the like.
  - **Reduced energy-related imports and increased energy security:** The construction of the proposed renewable energy project reduces dependence on imported fuels and improves the resilience of the local power sector.
  - **Social and gender benefits:** The developer has proposed to collaborate with academic and vocational training centres to promote renewable energies. In addition, the developer encouraged the direct/indirect participation of women in project-related activities by appointing “women champions” as part of its environmental and social organizational structure and to collaborate with local organizations to promote women’s entrepreneurship.
- For energy sector projects, progress reports must not only include technical project advancements but also cover complementary topics such as gender or Indigenous Peoples related matters, which should be periodically reported throughout the project lifespan.
- **Stakeholder engagement:** The GCF emphasizes stakeholder engagement as a critical component of project development. It involves local communities, government agencies, non-governmental organizations and private sector entities to ensure that project design and implementation take into account local needs and concerns. The 2021 CP in Chile, developed by the NDA, established the institutional framework for addressing climate change at both the central and regional levels. This framework incorporates participatory processes with the public (see Figure 1–6).

Figure 1–6. Institutional framework for climate change in Chile



Source: Government of Chile

- **Monitoring and evaluation:** Robust monitoring and evaluation mechanisms are put in place to track the progress and measure the impacts of energy sector investments over time. This includes assessing project contributions to GHG reductions, jobs creation, energy access improvements and other socioeconomic benefits. For FP017, the following progress was documented in the 2020 APR:
  - Throughout 2020, the average labour-force consisted of 220 people per month, 57 per cent of whom were from nearby communities and 99 per cent of whom were women. Six of these women were selected for a training course, along with 14 local men, to improve their knowledge and abilities in the solar photovoltaic industry.
  - In 2020, about USD 800,700 was invested in local companies through the local hiring and procurement strategy.
  - Significant efforts were made to build capacities in the community, working closely with educational institutions to have internships and to implement a specific programme about solar power plants for 20 local workers.

By integrating these elements into its approach, the GCF aims to ensure that energy sector investments not only mitigate climate change, but also foster sustainability, enhance resilience and generate socioeconomic co-benefits for the communities and countries involved.

Additionally, projects benefit from low-interest rates for investments, which mitigates underlying risks and increases the likelihood of success. These favourable interest rates can play a crucial role in fostering social co-benefits, particularly the benefits of loans extended to households and micro-, small- and medium-sized enterprises (MSMEs) in the market.

Furthermore, projects generate various social co-benefits such as environmental, social and economic co-benefits, including raising awareness on energy efficiency matters and gender-sensitive development impact.

b. Sustainability of the outcomes of GCF interventions in the energy sector

As only one country project has been completed in Chile, it is too early to evaluate the sustainability of outcomes from GCF activities in the country's energy sector. However, in the case of project FP017, which entailed a photovoltaic plant, long-term sustainability is influenced by the prevailing market conditions in Chile's electricity sector.

Currently, Chile is facing the implications of financial challenges experienced by companies generating electricity from photovoltaic technology. These difficulties primarily stem from negative externalities associated with variable energy generation sources and the unique characteristics of the Chilean electricity market. The market operates through a marginalist approach and possesses limited transmission capacity, which has not progressed at the same pace as electricity generation plants.

The interactions of these factors impact the long-term sustainability of photovoltaic plants, thereby warranting careful consideration when assessing the viability of GCF interventions in the energy sector in Chile.

c. GCF approach on innovation, replication and scaling-up of its interventions to support a transformation and paradigm shift in Chile

Interviewees perceive that the GCF is not notably risk-averse concerning energy projects in Chile. The most innovative project identified in Chile is FP115, which will not be continued due to some implementation challenges. This project was aimed at addressing three high priority and intertwined issues in the country: clean energy, water resource management and energy storage. Regarding other GCF projects, no evidence has been observed thus far that indicates successful replication and scaling of GCF financed projects and innovations in Chile.

4. Coherence between the GCF climate finance delivery with other multilateral entities

Thanks to the GCF, Chile has been able to better define its institutional framework for climate change, including for the energy sector, and prioritize the most relevant projects to meet its NDC through the development of the CP led by the NDA, in this case the Ministry of Finance. Currently, Chile's NDA is supported by the Technical Secretariat, which is coordinated by the Ministry of the Environment and includes representatives from the Ministry of Finance, the Ministry of the Environment and the Ministry of Foreign Affairs. Therefore, to the extent that the NDA and the Technical Secretariat work in a coordinated manner, there are signs that the GCF has enabled better coherence in the selection of energy sector-related projects to be financed in Chile.

Additionally, numerous interviewees underscored the considerable advantages associated with GCF investments compared to other multilateral funds in the context of the energy sector, encompassing the following key insights.

- Low cost of funding: The GCF provides financing at a favourable rate, supporting the economic viability and appeal of projects.
- Availability of grants: Although Chile's opportunities for grants are more limited compared to other priority groups (small island developing States, least developed countries and African States), access to these grants is not restricted for Chile. The GCF provides grants as a project instrument, as well as grants for TA and capacity-building through the RPSP.
- Readiness support opportunities: The GCF's readiness support presents valuable prospects for capacity-building and preparatory measures, ensuring efficient project execution, since

applicants can learn about GCF processes and understand the tools and requirements to be considered in financing proposals for new projects.

- Alignment with country NDCs: The GCF considers the development of a CP as a key activity for all countries. The preparation of CPs requires a global analysis of the key challenges facing each nation, and this analysis serves to align the list of proposed projects eligible for GCF funding with the specific goals and targets outlined in the country's NDC. Projects funded by the GCF align with the climate-related objectives outlined in the respective countries' NDCs, fortifying the collective commitment to climate action and sustainable practices.

It is noteworthy that the interviewees exhibited limited awareness regarding the sectoral guidelines of the GCF. This meant that the stakeholders were not able to compare the sectoral approach of the GCF with the approaches of other climate funds or multilateral banks.

5. GCF ENERGY SECTOR PROJECT APPROACH REGARDING GENDER EQUALITY AND INDIGENOUS PEOPLES

a. Gender equality and Indigenous Peoples considerations in energy project results

Chile's two single-country projects, FP017 and FP115, recognized the significance of gender equality. Consequently, they incorporated a gender action plan as a key component of their initiatives. The primary goal of both projects was to promote the participation of women in the energy sector, which is predominantly led by men in Chile. Interviewees highly appreciated that the GCF considers gender equality and the empowerment of indigenous communities to be crucial aspects. They particularly valued the availability of financial resources to support activities aimed at achieving such objectives.

Box 1–1. Highlighted initiative: Office for Gender and Human Rights within the Ministry of Energy of Chile

In 2022, the Ministry of Energy of Chile celebrated the official establishment of its Gender and Human Rights Office, which aims to develop public policies that promote gender equity and a human rights approach in the energy sector. This initiative has successfully institutionalized the gender mainstreaming efforts that were previously conducted in isolation, turning them into a policy that will endure over time. Below are some notable aspects and milestones that describe the work developed by the Ministry of Energy.

The Gender and Human Rights Office is promoting Chilean standard 3262 "Gender Equality and Work–Life Balance Management System", led by the Ministerio de la Mujer y Equidad de Género (Ministry of Women and Gender Equity), to become certified in good practices associated with gender equity. They also work with UN Women, which provides TA, lectures and tools on gender issues.

In 2023, women's participation in the energy market is only 23 per cent overall and 9 per cent in operational positions. The Gender and Human Rights Office aims to reduce the participation gap and the salary gap between men and women.

They have implemented the "Energy + Women" programme with the support of more than 100 companies and guilds in the sector to increase gender equity actions. This programme is a public–private effort to promote standards and deliver TA to professionals. The objective is to give more and better jobs to women in the energy sector. The goal for 2023 is to cover 100 companies, and for 2024 it is 200 companies, but commitments are not binding, only voluntary.

The Office also focuses on the skills development of professionals in the energy market. By 2030, 18,000 training sessions and 9,000 certifications are expected to be carried out, with a target audience of at least 30 per cent women, 10 per cent Indigenous Peoples, and 10 per cent people associated with the just transition associated with the shutdown of coal-fired power plants. The Office has implemented the "Educa

Sostenible" programme with the main objective of developing energy-related training without gender bias or stereotypes by working with teachers and students.

b. Implementation, monitoring and reporting of gender action plans and related co-benefits

Projects demonstrate a clear commitment to gender inclusivity through well defined gender action plans. For ongoing projects, the execution of these action plans is closely monitored and reported. As exemplified by the completed project FP017, the latest APR 2020, indicated that meetings and activities were successfully implemented according to the planned schedule in the initial three months of 2020. Subsequently, despite COVID-19 restrictions, activities continued, ensuring compliance with safety measures. The project also prioritized the empowerment of women, with three out of six selected participants receiving technical training in health, safety and the environment. Notably, procurement transactions were conducted with locally owned businesses operated by women, and female labour identified in the preceding reporting period continued to contribute to the project workforce. This steadfast commitment to gender equality underscores the project's dedication to fostering inclusivity and creating opportunities for women's participation and growth.

For project FP017, the gender component co-benefits were properly tracked and reported; however, there are no indicators on indigenous co-benefits in the project.

Based on the results of the assessments of available reports and interviews, we can state that the GCF gender equality component in the energy sector is mainstreamed. This is an aspect that all projects incorporate and that is valued by project implementers since it helps to generate better conditions for gender equality.

c. Actions related to Indigenous Peoples

Energy-related GCF projects recognize the significant importance of Indigenous Peoples considerations. This is relevant because it ensures that Indigenous Peoples benefit from GCF activities in a culturally appropriate manner and that they do not suffer harm and they do not experience adverse effects from the design and implementation of GCF-funded activities.

In Chile, indigenous and local communities have relevant influence on the development and implementation of energy projects. An example of an energy sector project that has recently faced this challenge is the Adobera geothermal project, located in La Araucanía Chile and co-financed by KfW and the European Union. This project has encountered opposition from the Mapuche communities and social organizations to the exploration phase of the project because the planned location for the project is the Tolhuaca volcano, which has a cultural and spiritual significance for the indigenous community (Diario Uchile, 2022).

In GCF project FP017, Indigenous Peoples have been considered in different activities, such as the development and implementation of the communication plan. Additionally, a community relations officer has been designated to facilitate constructive engagement with indigenous communities throughout the project design and implementation phases. This deliberate approach underscores the project's commitment to fostering positive and respectful relationships with Indigenous Peoples, ensuring their meaningful participation and representation throughout the project lifecycle.

6. THE EXTENT OF COUNTRY OWNERSHIP TOWARDS GCF INVESTMENTS IN THE ENERGY SECTOR

a. Inclusion of GCF energy sector investments in NDC implementation plans

Based on interview results, Chile has indeed updated its 2020 NDC, and the defined target is not contingent on external funding. However, interviewees mentioned that if additional funding becomes available, there is a possibility of surpassing the published target. Nevertheless, no specific values were provided. There is no direct correlation between Chile's NDC commitments and GCF investments.

In the context of Chile, the alignment between the national CP and the NDC is evident because the formulation of the CP took into direct consideration the nation's planning framework. This framework encompasses long-term policies, international obligations and the specific commitments outlined in the NDC.

b. Stakeholder ownership of implementation and the sustainability of results in the energy sector

Based on interview results, there appears to be a lack of awareness among relevant authorities in the energy market regarding the projects financed by the GCF in Chile. For instance, while the FP115 "Espejo de Tarapacá" project proposed by Energía Valhalla is well recognized in the market for its innovation and association with COP25 in Chile (2019), this knowledge is primarily related to its technical aspects. The fact that the project is being financed by GCF resources is not generally known or acknowledged by the public or some key stakeholders in the energy market.

Therefore, it appears that the ownership of implementation and the sustainability of results in the energy sector are not widely established in Chile.

c. Inclusion of subnational stakeholders in activities

The involvement of relevant subnational authorities varies depending on the nature of the project, particularly at the municipality level. Engaging with local municipalities is crucial to comprehend the specific local context and design activities that positively impact the development of individuals who might be affected by project implementation. A case in point is the FP017 project whereby the municipality of Pica played 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.

7. FOSTERING TECHNICAL INNOVATION AND THE DEPLOYMENT OF DIVERSE FINANCIAL INSTRUMENTS IN THE ENERGY SECTOR BY THE GCF

Regarding the GCF's catalytic role in investing in innovative approaches and innovation in FPs, the findings are as follows:

- The Valhalla FP115 project stands out for its innovativeness by providing 24-hour baseload energy through a combination of pumped storage hydroelectric energy and a solar power plant. In addition, the project meant to contributes to climate change adaptation by providing stable water supply from its own desalination plant to vulnerable local communities.
- Assessing the innovativeness of GCF-funded projects requires local context considerations for each country because what may be innovative in one country may not hold the same level of novelty in another. One interviewee mentioned that a project proposal associated with

sustainable housing was not pursued despite the needs and demands in the country, and the GCF team indicated that if the same proposal had been submitted in another country, it would have been approved.

- The scope of GCF financing is not always well defined, creating uncertainties especially in areas such as hydrogen-related initiatives for which clear answers may not be readily available. To optimize GCF effectiveness, several interviewees mentioned that Chile should articulate a focused approach for utilizing GCF resources rather than trying to cater to all possible areas.
- For supporting innovative projects, the GCF should better align with private sector expectations and assume the risks associated with implementing highly innovative endeavours. Streamlining bureaucratic processes is essential to ensure projects move forward smoothly, and there should be improved clarity in the decision-making process across different project phases.

8. THE EXTENT OF GCF ENERGY SECTOR INVESTMENT REPLICABILITY AND SCALABILITY WITH THE OBJECTIVE TO TRANSFORM THE MARKET

Based on interview results, it has been suggested that expanding the option of accessing non-reimbursable funds would be beneficial for Chile and other countries. In general, countries are expressing a growing demand for non-reimbursable funds. For example, the prospect of creating a green hydrogen industry with non-reimbursable funds is interesting for the private sector.

The Ministry of Environment has received substantial support from the GCF to advance the development of public policies, particularly in the realm of sectoral adaptation plans. These plans encompass areas such as water resources, agriculture and the national adaptation plan. Furthermore, GCF initiatives extend to subnational strengthening, with a focus on empowering and enhancing the capacity of various regions. The projects implemented in association with the GCF and pertaining to adaptation are primarily centred around updating or formulating public policies to address climate challenges effectively.

C. EMERGING LESSONS FOR THE GCF

The following emerging lessons for the GCF can be drawn from the Chilean case study.

- **Low awareness about the GCF as a source of financing for climate change in the Chilean energy sector.** In Chile, it has been noted that the GCF does not currently function as the principal funding source for climate change projects in the energy sector, and there is no comprehensive understanding of its operational complexities among key stakeholders in the energy sector. This situation is significantly influenced by the fact that there are several sources of multilateral financing available in Chile, such as IDB, KfW, Euroclima, the Global Environment Facility (GEF) and the United Nations Environment Programme, among others.[2] Some of these sources are more widely recognized in the market and have been utilized to a greater extent compared to the GCF. For example, the GCF has so far developed seven projects in Chile (Green Climate Fund, n.d.); in contrast, the GEF has developed 17 national projects and 18 regional/global projects (Global Environment Facility, 2023).
  - Several interviewees also pointed out that the information required to access GCF resources is available on the website. However, it is often not easy to locate, not updated and not easy to understand. Interviewees have expressed that they lack the time to

[2] This list was obtained from the interviews.

thoroughly review all the documentation accessible on the GCF website to comprehend its operations.

  - There is therefore an opportunity for the GCF to improve communication efforts and enhance coordination between itself and pivotal private and public stakeholders in Chile's energy sector, to leverage GCF resources to develop and implement more projects. These actions have the potential to streamline the implementation of climate projects to achieve the country's carbon neutrality objectives by 2050.

- **Absence of centralized climate finance coordination reduces the influence of the NDA over the development and implementation of energy-related projects.** In Chile, the current NDA is the Ministry of Finance (a stakeholder not related to the energy sector), and its team is relatively new and small and has been operating since October 2022. The team mainly consists of three professionals, the Undersecretary, the Head of the Public Debt Office and the International Finance Coordination Advisor. Despite being relatively recent, it is worth highlighting the NDA's strong motivation to take a more active role in coordination efforts. It has already identified areas for improvement, including the revision and update of Chile's CP and the expansion of the number of national AEs, given that there is currently only one national AE in Chile, FYNSA.
  - However, the Ministry of Finance is the focal point for the GCF only, and different ministries – for example, the Ministry of Environment – act as the country focal points for other climate-related funds, such as the GEF. The Technical Secretariat is composed of representatives from the Ministry of Finance, Ministry of Environment and Ministry of Foreign Affairs and provides the national institutional framework to discuss climate change related issues that cover the energy sector. The lack of a centralized climate finance entity hinders the effective and coordinated planning and development of projects.
  - The interviews also revealed that there is currently no direct and regular engagement between the NDA and the private sector. Such a relationship is crucial for increasing the number of GCF projects in the energy sector, especially considering that the energy sector has been strongly influenced by the private sector since 1980 (Fundación Terram, n.d.).
- **The GCF needs to align its operations with private sector standards, especially speed of operation, to increase more private investment and leverage it effectively.** In Chile, the energy market is predominantly driven by the private sector, in contrast to other economies in the region. There are seven Board-approved projects in Chile. All of them are private sector projects and have mitigation components, four of which are in the energy sector. One of the most recurrent comments in the interviews was that the GCF's processing times are notably longer compared to those of the private energy sector in Chile and even to those of the public sector. Some of the received comments are as follows:
  - "The preparation durations for GCF projects are notably extended, often exceeding two years. This extended timeline frequently commences under one administration and culminates under another, occasionally resulting in a misalignment of priorities."
  - "The procedures could benefit from greater digitalization and the establishment of predefined time frames for involved parties. For instance, the GEF currently allows a 10-working-day window for responses with a lack of response being interpreted as approval."
  - "The interval between an application submission and the initial disbursement can extend to three to four years. During this time frame, market conditions may undergo significant changes, and it is possible that the governing administration that initially endorsed the project may not be the same."

The GCF must therefore enhance its flexibility and streamline its processes if it intends to collaborate effectively with the Chilean private sector. Otherwise, project proponents may seek funding from alternative sources or may face the risk of not being executed at all. A clear example of the above is the FP115 project:

- The approval process of the project took one and a half years, from 2017 to 2019.
- In the 2020 APR, it was indicated that, regarding debt co-financing, given that lenders require the project to have 100 per cent committed equity co-financers, a PPA or other long-term contract was required before engaging in project finance discussions. When the FP was approved, the announced public PPA auction date was November 2019; it was later postponed several times, first to May 2020, then to November 2020, and then to May 2021 (mainly due to COVID-19, more ambitious decarbonization commitments and a lower estimate of demand).
- In the 2021 APR for FP115, it was indicated that project stakeholders held discussions with several potential strategic investors during 2021. After several months of discussions, in August 2021, the project executed a non-binding term sheet with EDF Andes SpA. The selection of a strategic investor is closely linked to the award of a PPA; for this reason, discussions have included a joint development agreement with an option for the investor to enter the project upon PPA award. The project company's Board of Directors approved the non-binding term sheet with EDF Andes SpA, which 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 complex bureaucratic procedures for approval. In light of these procedural challenges, the chosen strategic partner expressed dissatisfaction with the timeline and ultimately withdrew from the project. Consequently, the company formally requested that the GCF terminate the contract and oversee the liquidation of the company's assets as the feasibility of securing another strategic partner became untenable. In October 2022, the GCF granted approval for the sale of the project's assets.

- **The GCF must clearly define the level of risk it is willing to accept in the implementation of projects and must be consistent throughout the project life cycle.** It was observed that the level of risk that the GCF is willing to accept at the implementation stage is lower than at the project application stage. This decrease in risk tolerance over time poses challenges for the development of successful and innovative energy sector projects. One example is FP017, which encountered bureaucratic hurdles and challenges during project implementation, and a flexible and fast response from the GCF was crucial for mitigating market risks. Low-risk aversion during the implementation stage led to not being able to apply the measures proposed by the project team, and finally the project was not implemented.

APPENDIX 1–1. LIST OF INTERVIEWEES

FULL NAME	FUNCTION	AFFILIATION
Marcel Silva	Head of Self-consumption Development Unit	Ministry of Energy
Francisca Valenzuela	Head of the Gender and Human Rights Office	"Energía + Mujer" Programme
Caterin Pinto	Ministerial Cabinet Advisor	Ministry of Transport and Telecommunications
Cristina Victoriano	Deputy Executive Director	Energy Sustainability Agency (Chile)
Analía La Rosa	Senior Fiduciary Specialist	IDB
Christiaan Gischler	Lead Energy Specialist	IDB
Natacha Marzolf	Principal Energy Specialist	IDB
Martín Lobos	International Finance Coordination Advisor	Ministry of Finance
Patricio Sepúlveda	Head of the Chilean Debt Office	Ministry of Finance
Jenny Mager	Head of Climate Change Division	Ministry of Environment
Kimberly Cantillana	Climate Finance Professional	Ministry of Environment
Carlos Berner	Director of Financial Risk and Guarantee of Educational Infrastructure	CORFO
Ana Lía Rojas	Executive Director	ACERA
Andrés Rebolledo	Executive Secretary	OLADE
Reynaldo Cabezas	Executive Secretary Committee for Sustainability	Energy Poverty Network
Paz Araya	Researcher	Energy Poverty Network

Note: Due to legal and ethical considerations, we are not permitted to identify or list any agencies that have applied for but not yet received accreditation. These agencies are therefore not listed. Two of the interviewed organizations requested not to have the name of the organization or the persons interviewed indicated; therefore, they have not been included in the list.

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2. INDONESIA COUNTRY CASE STUDY REPORT

CONTENTS

TABLES

BOXES

A. BACKGROUND AND CONTEXT

This report summarizes the results of the Indonesia country case study that was prepared under the framework of the Independent Evaluation of the GCF Energy Sector Portfolio and Approach. This case study provides important evidence on the results achieved (including unintended results) by GCF-funded activities in the energy sector; the GCF's competitive advantage within the country context; the coherence of GCF objectives at the country level, including the role of CPs in supporting energy sector objectives; and a country-level perspective on GCF support related to innovation.

This country case study report for Indonesia is based on the results of a desk review, interviews (see Appendix 2–1), and a country mission undertaken from 2 to 7 July 2023. The country mission team included Lilit Gharyan (Econoler consultant), Genta Konci (GCF IEU) and Viktoria Khan (GCF IEU). Within one week, more than 20 interviews were conducted.

1. COUNTRY CONTEXT

Table 2–1. Overview of Indonesia's country context

CATEGORY	COUNTRY
Demographics	The total population of Indonesia is 279,476,346 (2023 estimate) (urban: 58.6 per cent, rural 42.4 per cent) (Central Intelligence Agency, 2024). 9.4 per cent (2019 estimate) of the population lives below the national poverty line (Central Intelligence Agency, 2024).
GCF group status	Asia Pacific
Governance conditions	As evaluated by the WB's six governance indicators (2021 data), Indonesia ranks relatively high for the Government Effectiveness (65th percentile) and Regulatory Quality (62nd percentile) indicators, average in the Voice of Accountability (53rd percentile) and Rule of Law (47th percentile) indicators, and relatively low in the Political Stability and Action Against Violence/Terrorism (28th percentile) and Control of Corruption (39th percentile) indicators (Kaufmann and Kraay, 2023). Fragile and conflict-affected State status: N/A (World Bank, 2022). Governance: Indonesia is a presidential representative democratic republic, whereby the President of Indonesia is both the Head of State and the Head of Government. The current President is Joko Widodo.
Economic and development conditions	Development status: Upper middle income (World Bank, 2023b). Economic growth: Indonesia is the largest economy in South-East Asia and the world's 10th largest economy in terms of purchasing power parity. In 2022, Indonesia's economy grew by 5.31 per cent (the highest in the past nine years), the sources of growth on the expenditure side were the household, transport, communication and hotel/restaurant sectors. Being a resource-rich country and a major supplier of thermal coal, palm oil and nickel, Indonesia enjoyed rising commodity prices due to the war in Ukraine. Exports saw the highest growth among the expenditure segments, at 16.28 per cent. Surging foreign tourist arrivals also drove growth in the export of services. The highest growth on the production side was the transportation and storage industry, at 19.87 per cent (Badan Pusat Statistik, 2023). Outlook: Indonesia's economic growth is expected to moderate to 4.9 per cent in 2023 and stay relatively flat at 5 per cent in the medium term. Growth will be supported by private consumption. The growth in exports will be moderately driven by softening palm oil and coal prices, among other factors. Imports will also be

CATEGORY	COUNTRY
	moderate, in line with moderating domestic demand and investments in 2023 (World Bank, 2023a).
Access to finance	The banking sector assets-to-GDP ratio in Indonesia is 43.29 per cent (2021) (TheGlobalEconomy.com, n.d.). According to the WB's Global Findex Database, 51.76 per cent of adults (age 15+) in Indonesia had an account at a financial institution in 2021 (compared to the average of 71.6 per cent in developing countries and 80.78 per cent in the East Asia Pacific region) (World Bank, 2024). Microfinance: Microfinance plays a significant role in providing financial services to unbanked and underbanked Indonesian populations, especially in rural areas and among low-income individuals. Microfinance initiatives began in the 1970s with the establishment of cooperatives. In the 1990s, the government initiated various programmes to promote microfinance and support the development of MSMEs. The microfinance regulatory environment is overseen by the Indonesian Financial Services Authority (Otoritas Jasa Keuangan). Microfinance institutions offer a range of financial products, including microloans, microsavings, microinsurance and remittance services. In recent years, digital technology has played a crucial role in expanding microfinance services to more people in Indonesia. Mobile banking, mobile money and digital lending platforms have enabled easier and faster access to financial products and services. Capital markets: Indonesian capital markets are regulated and supervised by the Financial Services Authority of Indonesia. The Authority oversees capital market activities, protects investors' interests and ensures market integrity. The Indonesia Stock Exchange, also known as Bursa Efek Indonesia, is the primary platform for trading equities and other securities. It plays a pivotal role in raising capital for companies through initial public offerings and providing a marketplace for investors to buy and sell shares. The equity market is a significant component of Indonesia's capital markets. The stock exchange lists various companies from different sectors, representing both domestic and foreign enterprises. The bond market in Indonesia facilitates the issuance and trading of government bonds, corporate bonds and other debt securities. The Government often uses bonds to finance its budget deficit and fund development projects. The Government of Indonesia and the country's regulatory authorities have implemented several reforms to develop and strengthen the capital markets. These reforms are aimed at enhancing transparency, improving investor protection, and encouraging more listings and investments in the capital markets.

2. ENERGY SECTOR CONTEXT

The energy sector in Indonesia is of paramount importance to the country's economic development and plays a significant role in meeting its energy needs. Indonesia is one of the world's most populous countries and a major emerging economy, with a diverse and rapidly growing energy demand.

Indonesia is rich in natural resources, particularly in fossil fuels. It is a major producer and exporter of coal, a dominant source of power generation. The country also has significant oil and natural gas reserves, with oil production concentrated in regions such as Sumatra, Java and Kalimantan and natural gas reserves mainly found offshore.

The electricity sector is a critical component of the energy landscape. The country relies heavily on fossil fuels for electricity generation, with coal being the primary source. However, there is growing interest in diversifying the energy mix by increasing the use of renewable energy sources such as geothermal, hydro, solar and wind power.

Energy consumption in Indonesia has been rising steadily due to rapid population growth as well as increasing urbanization and industrialization. Electricity demand is expected to increase significantly in the coming years, and actions in terms of energy efficiency and additional electricity capacity are needed to meet the energy needs of the growing population and economic expansion.

Despite being a major producer of fossil fuels, Indonesia faces energy security challenges. Increased energy consumption has outpaced production capacity, leading to a rise in energy imports, particularly in oil and refined petroleum products.

In recent years, Indonesia has been taking steps to promote renewable energy development and reduce its reliance on fossil fuels. The Government of Indonesia has set ambitious targets to increase the share of renewable energy in the energy mix, aimed at reaching 23 per cent by 2025.

Improving energy efficiency is a priority for Indonesia to optimize energy use and reduce waste. The Government of Indonesia has been implementing energy efficiency programmes in various sectors, including in transportation, industry and buildings.

Box 2–1. Indonesia and the Just Energy Transition Partnership

During the G20 meeting held in Bali, Indonesia, in November 2023, the European Union and the International Partners Group (the United States, Japan, Canada, Denmark, France, Germany, Italy, Norway and the United Kingdom) launched the Just Energy Transition Partnership (JETP) during a Partnership for Global Infrastructure and Investment event (European Commission, 2022). The JETP includes an accelerated power sector emissions reduction pathway to net zero by 2050 and a strategy based on the following:

- The expansion of renewable energy capacity
- The phasedown of on- and off-grid coal-fired electricity generation
- Further commitments to regulatory reforms and energy efficiency

Overall, the aim of this long-term JETP with Indonesia is to mobilize an initial USD 20 billion in public and private financing over a three- to five-year period, using a mix of grants, concessional loans, market rate loans, guarantees and private investments. This will pave the way to achieving the country's ambitious climate and energy targets.

Half of this sum, USD 10 billion, will be mobilized by International Partners Group members. The European Union and its Member States that are part of the Group intend to mobilize around USD 2.5 billion. From this amount, the European Union will support the JETP via the European Investment Bank with EUR 1 billion to support eligible projects that contribute to the decarbonization of Indonesia's power system through the development and integration of renewable energy. In addition, the European Union will earmark EUR 25 million in grants and TA.

Source: IEU evaluation team

a. Energy matrix

Indonesia's energy supply mix is dominated by fossil fuels, particularly coal and oil. According to the International Energy Agency, in 2021, coal accounted for around 30 per cent of Indonesia's primary energy supply, followed by oil at 29 per cent, natural gas and biofuels and waste at around 14 per cent each, and wind and solar at 12 per cent. However, Indonesia has significant renewable energy potential, particularly in wind, geothermal and hydropower, and has been taking steps to diversify its energy mix (International Energy Agency, 2024).

In terms of end uses, the International Energy Agency found that the majority of Indonesia's electricity consumption is attributed to the residential and industrial sectors, which account for approximately 41 per cent and 36 per cent of total electricity consumption respectively (2021 data). In 2020, final energy consumption by sector was broken down as 43 per cent transportation, 34 per

cent industry, 17 per cent households, 5 per cent commercial and the remainder to others (Indonesia, Ministry of Energy and Mineral Resources, 2021).

b. Sustainable development in the energy sector and related policies

Table 2–2. Sustainable energy policies and strategies

STRATEGY	STATUS	BRIEF DESCRIPTION
National energy policies	Enacted	Indonesia's broad development goals are outlined in its 2005–2025 Long-Term National Development Plan. This plan is divided into four 5-year phases. Long-term goals for the energy sector are outlined in the 2014 National Energy Policy, to be implemented in the National Energy Plan, which emphasizes resource diversification, environmental sustainability and the maximized use of domestic resources. The policy targets an energy mix of oil (25 per cent), gas (22 per cent) and coal (30 per cent), as well as new and renewable energy (23 per cent) by 2025. Long-term goals for the electricity subsector are in the Government of Indonesia's National Electricity Plan, with specific investment plans outlined in the utility company Perusahaan Listrik Negara's Electricity Supply Business Plan, updated annually. Government-led reforms and programmes initiated from 2016 to 2020 had the following aims: • Improving sector governance and expanding energy production through more private sector investments and effective public sector investments. • Increasing the country's use of domestic resources and expanding renewable energy generation and energy efficiency investments. • Expanding access to modern energy for all Indonesians. The 2020–2024 government strategy is focused on shifting from dependence on foreign oil to supporting domestic industries and sources of power, mainly coal, geothermal and hydropower. For the foreseeable future, the Government of Indonesia will continue to invest in the development of a domestic coal industry, which will be the main contribution to Indonesia's energy supply beyond 2028. The installed capacity of coal is set to nearly double over the next decade. Simultaneously, the Energy and Mineral Resources Minister has announced plans to replace decommissioned coal plants with new and renewable energy to meet growing demand across the archipelago, indicating national support for meeting energy mix targets. Recent and planned regulations and decrees are aimed at establishing clear guidelines and reducing red tape around private sector involvement and land-use for all large-scale renewable energy projects – including geothermal development, rooftop solar and floating solar – as well as around the commercial and legal implications of utility-scale solar.
Enhanced nationally determined contribution (ENDC)	Submitted in 2022	Indonesia submitted its first NDC in 2016, an updated NDC in 2021 and an enhanced NDC in 2022. The updated NDC includes the following key elements (Indonesia, 2022): **Mitigation targets**: Government Regulation No. 79/2014 on the National Energy Policy sets out the ambition to transform the primary energy supply mix, with shares as follows: (i) at least 23 per cent in new and renewable energy by 2025 and at least 31 per cent by 2050; (ii) oil should represent less than 25 per cent by 2025 and less than 20 per cent by 2050; (iii) coal should represent at least 30 per cent by

STRATEGY	STATUS	BRIEF DESCRIPTION
		2025 and 25 per cent by 2050; and (iv) gas should represent at least 22 per cent by 2025 and 24 per cent by 2050. **Adaptation measures**: The goals of Indonesia's climate change adaptation strategy are to reduce risks, enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change in all sectors. These goals will be achieved through, inter alia, enhanced climate literacy, strengthened local capacity, improved knowledge management, converging the climate change adaptation measures with disaster risk reduction, and the application of adaptive technology. In achieving its adaptation goals, Indonesia focuses on three areas of resilience – namely, economic resilience, social and livelihood resilience, and ecosystem and landscape resilience. These three areas of resilience have been elaborated in the NDC Adaptation Road Map, which is operationally prioritized into several fields – namely, food, water, energy, health and ecosystems.
National adaptation plan (NAP)	Enacted in 2014	Climate change will potentially cause various hazards in Indonesia, including prolonged droughts, flooding and increasing extreme weather events that will have social, economic and environmental impacts, such as crop failures, reduced capture fishery production, reduced livelihoods and opportunities thereof, biodiversity loss, and an increased number of outbreaks related to various types of infectious diseases. Adaptation action strategies in the development of climate resilience in the short, medium and long terms are needed to protect communities and ensure sustainable development, especially for preventing future massive socioeconomic losses. To anticipate the potential negative impacts, the Government of Indonesia is committed to the preparation of the National Action Plan for Climate Change Adaptation, or the NAP, as the main reference in planning climate change adaptation actions through the adoption of adaptive criteria. Indonesia's NAP identifies several key risks and vulnerabilities associated with climate change in the following priority sectors: water, coastal, marine, agriculture and health. For each of the priority sectors, the NAP includes adaptation targets, interventions and delivery strategies (Indonesia, National Development Planning Agency, 2014).

c. Institutional roles and responsibilities in the energy sector

The primary entity tasked with governing the energy sector in Indonesia is the Ministry of Energy and Mineral Resources (MEMR). Within MEMR, different directorates-general are focused on specific areas such as oil and gas, minerals and coal, electricity, new and renewable energy sources, and energy conservation. MEMR holds the key responsibility for policymaking, decision-making, and overseeing energy and mining assets, along with implementing technical programmes and projects. It is also responsible for preparing the National Energy Plan and the National Electricity Plan.

MEMR, with its Directorate General of Electricity and Directorate General of New and Renewable Energy and Energy Conservation, is responsible for regulating the power sector and collecting and disseminating national energy data.

For the oil and gas sector, the Directorate General of Oil and Gas serves as the governing body responsible for policy-setting and regulations. The sector is further divided into upstream, midstream and downstream activities. The Special Task Force for Upstream Oil and Natural Gas

Business Activities manages exploration and production contracts, while the Regulatory Body for Downstream Oil and Natural Gas Business Activities oversees midstream and downstream operations.

The National Energy Council collaborates with seven ministries and energy sector stakeholders to develop the National Energy Policy, approve the National Energy Plan, and establish frameworks to handle crises and energy emergencies. The Coordinating Ministry for Maritime and Investment Affairs is responsible for coordinating energy-related matters across various ministries. Other relevant ministries, such as the Ministry of National Development Planning, play a role in preparing Indonesia's National Medium-Term Development Plan, which guides government programmes and budgeting, including activities related to energy supply and demand. The Ministry of Finance allocates the budget, approved by the People's Representative Council, for the State expenditures of MEMR, including energy subsidies, government guarantees and tax regimes for energy-related products, infrastructure and operations.

Several other government agencies and ministries are involved in regulating compliance with energy sector laws and policies. For instance, the Ministry of Public Works and Public Housing oversees water use rights and taxes related to hydropower plants. The Ministry of Environment and Forestry approves access to forest land for energy projects and enforces environmental standards and regulations for resource extraction and energy production. The Ministry of State-Owned Enterprises is responsible for the corporate governance of State-owned enterprises, including those involved in the energy sector, and acts as the government representative for national State-owned enterprises.

3. ENERGY SECTOR GCF PORTFOLIO

Indonesia developed its CP in 2018. The programme highlights Indonesia's climate profile and climate change response. The document describes the GCF's engagement in the country's climate agenda, including institutional arrangements, roles and contributions of key stakeholders, the process of identifying country priorities for the GCF, as well as the country portfolio.

In the CP, energy generation and access are the number one priority area under climate change mitigation.

NDA. The NDA in Indonesia is the Fiscal Policy Agency, under the Ministry of Finance.

Direct accredited entities. Kemitraan bagi Pembaruan Tata Pemerintahan (Partnership for Governance Reform) (Indonesia) (Kemitraan) and PT Sarana Multi Infrastruktur (Indonesia) (PTSMI).

Readiness and project preparation in the energy sector. Indonesia has received one Readiness and Preparatory Support Programme (RPSP) grant in the energy sector.

1908-15830: The Readiness Programme, implemented by GGGI, is aimed at enhancing climate finance focal point coordination, building project pipelines, and developing a climate finance strategy, including identifying the role of the Indonesia Environment Fund in the country's climate finance strategy.

Table 2–3. Funded activity portfolio in the energy sector

Project number	Name	Public/ private	Sectoral guide				AE	Approval date/status	GCF energy investments (USDm)	Total GCF budget (USDm)
			Energy generation and access	Energy efficiency	Cities, buildings, and urban systems	Low emission transport				
FP083	Indonesia Geothermal Resource Risk Mitigation Project	Public	X				WB	28 October 2018	100	410
FP099	Climate Investor One (CIO)	Private	X				Netherlands Development Finance Company (FMO)	20 October 2018	100	821.5
FP151	Global Subnational Climate Fund (SnCF Global) – Technical Assistance (TA) Facility	Private	X	X	X		International Union for Conservation of Nature	13 November 2020	18	28
FP152	Global Subnational Climate Fund (SnCF Global) – Equity	Private	X	X	X		Pegasus Capital Advisors	13 November 2020	150	750
FP156	ASEAN Catalytic Green Finance Facility (ACGF): Green Recovery Programme	Public	X	X	X	X	Asian Development Bank (ADB)	19 March 2021	300	3,685
FP190	Climate Investor Two	Private	X	X			FMO	20 July 2022	145	880
FP194	Programme for Energy Efficiency in Buildings (PEEB) Cool	Public			X		Agence Française de Développement	20 October 2022	235.84	1,430.14
FP196	Supporting Innovative Mechanisms for Industrial Energy	Private		X			Korean Development Bank	17 October 2022	105	247.7

Project number	Name	Public/ private	Sectoral guide				AE	Approval date/status	GCF energy investments (USDm)	Total GCF budget (USDm)
			Energy generation and access	Energy efficiency	Cities, buildings, and urban systems	Low emission transport				
	Efficiency Financing in Indonesia with Lessons for Replication in Other ASEAN Member States									
FP197	Green Guarantee Company (GGC)	Private	X	X			MUFG Bank	17 October 2022	40.5	USD 181.5

Source: IEU DataLab

B. KEY FINDINGS

1. ALIGNMENT WITH THE GCF MANDATE AND INDONESIA'S ENERGY SECTOR NEEDS

All interviewed local stakeholders are unanimous in their view that the GCF's strategy for advancing the energy sector in the country is highly aligned with the nation's top priorities and overall energy market. The GCF is widely recognized by all interviewees as a potential key contributor to the ongoing market transition.

According to interviewees, the GCF CP and investments are in line with Indonesia's energy sector policies and strategies. Specifically, GCF energy sector projects are structured around Indonesia's goals to transform the energy mix as follows: (i) at least 23 per cent in new and renewable energy by 2025 and at least 31 per cent by 2050; (ii) oil should represent less than 25 per cent by 2025 and less than 20 per cent by 2050; (iii) coal should represent at least 30 per cent by 2025 and at least 25 per cent by 2050; and (iv) gas should represent at least 22 per cent by 2025 and at least 24 per cent by 2050. Moreover, there is a lot of interest in and much reliance on attracting GCF funding for achieving NDC commitments.

2. CONTRIBUTION TO ACHIEVING CLIMATE GOALS IN INDONESIA THROUGH GCF ENERGY SECTOR PROJECTS

The GCF Indonesia CP was approved in March 2018. This programme is designed to assist accredited organizations in developing and aligning their climate project FP with Indonesia's key priority areas. The GCF Indonesia CP encompasses a range of national development and climate change policies as well as sector-specific policies. It identifies priority areas that include both mitigation and adaptation activities, with the top priorities being energy generation and access.

In an effort to promote a shift towards low-emission and climate-resilient development, the CP seeks to achieve several key objectives. These include harmonizing international climate finance with Indonesia's fiscal priorities and development policies, coordinating and allocating GCF funding for areas with financial and development gaps, and ensuring that programmes seeking GCF funding incorporate environmental and social safeguards and engage in inclusive processes.

Most interviewees confirmed that the design of energy sector projects in Indonesia is in line with the climate goals of the country and the objectives set out in the country's NDC, sectoral strategies and overall country priorities in climate action and, specifically, in the energy sector.

All energy sector projects are designed to contribute to reducing emissions, include considerable adaptation components and have strong potential to initiate a paradigm shift. For example, FP196 is designed to increase Indonesia's capacity to drive a low-carbon development pathway with enhanced energy efficiency and conservation performance by addressing chronic barriers (e.g. access to finance, lack of technologies, legislative barriers). The CP provides a package of innovative energy efficiency solutions including financial de-risking mechanisms, exploration of new energy service business models, development of a supportive regulatory framework, and TA.

FP083, for example, aims to help the Government of Indonesia scale up geothermal energy development by introducing a well designed upstream risk-mitigation mechanism and promoting a conducive regulatory environment. Under that project, both public and private sector geothermal developers have access to funds to help mitigate early-stage development risks.

a. Likelihood of GCF energy sector projects achieving expected results

Based on interview and desk review results, the likelihood of achieving the expected results of GCF energy sector projects (outputs) is currently low since most projects have not yet been launched and have been delayed.

The majority of energy sector projects in Indonesia are multi-country, and most of them (FP151, FP152, FP156, FP190, FP194, FP196, FP197) have had no activities in Indonesia yet, which is conditioned partially by the challenges specific to the Indonesian energy sector, complexities related to structuring and implementing multi-country projects, and tailoring country activities to country-specific circumstances and realities in the energy sector.

FP083 (The Indonesia Geothermal Risk Mitigation Project–GREM Facility), however, has certain preliminary promising results, as follows:

- An operations manual has been finalized and converted into a developers' manual that enables geothermal developers to access detailed information regarding the GREM Facility, including guidance for developers to apply the facility.
- Two pre-applications have recently been received and initial disbursements are estimated to take place in calendar year 2025. The GREM Facility has not received any pre-applications through the private window. In terms of GREM funds utilization, by the end of Q4 2022, there had been no utilization under Component 1 for both disbursement from the WB to PT Sarana Multi Infrastruktur (PT SMI) and disbursement from PT SMI to developers.
- Under Component 2, nine different capacity-building activities were provided over to strengthen PT SMI capacity, including a site visit to the Geo Dipa Energi Patuha Geothermal Power Plant to enhance PT SMI team capacity in geothermal environmental and social risks and impact assessments. Several consultancy services have been selected to support PT SMI in the upcoming due diligence process. The capacity-building activity plan has also been developed.
- Key regulatory framework changes for GREM to facilitate geothermal exploration projects were made with the issuance of the Presidential Regulation No. 112 of 2022 on the Acceleration of Renewable Energy Development for Electricity Supply. These regulatory changes are considered to have a positive impact on the GREM Facility.
- Developed the environmental and social management framework to manage its environmental risks and impacts, which was published on the PT SMI and WB websites in May 2019 and is publicly available.

b. Changes in the practices of the AEs and other stakeholders in Indonesia triggered by GCF energy sector projects

The results of the document reviews and interviews indicate that the national AEs have gained certain capacities as well as strengthened the systems, structures and processes necessary to successfully fulfil the functions of an AE during the accreditation process as well as in the course of funding proposal development. Specifically, the institutions became more aware about corporate governance, environmental and social safeguards, and other important topics.

Importantly, a few interviewees also mentioned that having similar or identical processes among different climate funds would be very efficient and beneficial.

c. Co-benefits of GCF energy sector projects in Indonesia

Some of the major economic co-benefits of GCF energy sector projects are the GCF's low funding costs and higher risk appetites, which ensure investments in energy sector technologies and projects

that otherwise would not be implementable because commercial financial institutions perceive investments in green energy (specifically in renewable energy technologies) as too risky (as highlighted by several interviewees).

When it comes to other energy sector project co-benefits, the following should be highlighted:

- The potential for creating new jobs and the development of technical capacities through the introduction of new technologies in energy efficiency and renewable energy
- Capacity-building and awareness-raising on the benefits of energy efficiency and renewable energy technologies among specific groups and the public at large (businesses and households)
- Enhanced access to finance opportunities for small and medium-sized enterprises and households

d. Adaptation of GCF practices in energy sector interventions and investments in Indonesia

Adapting current project scopes and activities to the changing environment is usually slow and sometimes unrealistic due to the following issues highlighted by interviewees: (i) complex and rigid processes in project design approval stages leading to project design not always reflecting Indonesia's market needs and specifics; (ii) delays in project launch and implementation lead to situations whereby projects (or their components) are no longer relevant to the issues and needs of the energy sector; and (iii) AEs and implementing partners usually avoid requesting/introducing any modifications to project modalities due to the complexities in related GCF processes.

The desk review and interview results indicate that some projects need to be adapted. For example, the financing mechanisms, schemes and eligibility criteria of FP083 (GREM) require certain changes. It must be mentioned that certain modifications to regulatory frameworks (as described in section 3) have taken place and are considered to have a high positive impact on GREM project facility implementation.

e. Major positive and negative elements contributing to or hindering the achievement of project results in Indonesia

i. Positive

There is a relatively high level of awareness among key stakeholders from different sectors (including the energy sector, financial sector, public sector and others) about GCF projects as well as a high level of interest in projects and RPSP.

GCF funding is certainly perceived as concessional and a notably cheap source of funding, which additionally motivates different stakeholders to apply for GCF funding.

Possible access to local currency funding is considered as one of the major benefits that the GCF can provide to potential beneficiaries. Specifically, financial institutions are very interested in accessing local currency funding from the GCF since access to local currency funding by companies and households is yet another de-risking mechanism. It protects end clients from economic shocks in times of local currency fluctuations against hard currencies.

The Government of Indonesia is very interested in accessing and utilizing GCF funding to the extent possible. During interviews, we observed clear interest and preference for GCF funding to finance energy sector projects in line with government strategies and country climate action commitments.

The evaluation team has not identified any unintended positive or negative results so far, mainly due to the early implementation stage of most projects.

ii. Negative

The slow GCF processes, lack of timeliness (long delays between the programme design and implementation stages) and lack of flexibility in terms of project modifications all present tremendous obstacles in terms of implementing projects.

Indonesian energy sector specifics (e.g. low energy tariffs due to access to cheap coal resources, high transmission costs, low level of awareness, need for complex renewable energy technologies) are other major barriers hindering the effective and efficient implementation of projects.

It has also been highlighted that, despite concessional funding conditions and low-interest rates, the GCF does not have mechanisms to decrease the cost of funding for final beneficiaries. Specifically, there is no mechanism to cap finance interest rates extended to final beneficiaries. This is specifically relevant for projects that extend credit lines or other financing facilities (e.g. FP083, FP196) such as loans and other types of financing via financial institutions (including commercial banks).

As mentioned above, there is a big challenge in terms of implementing multi-country projects. Based on interview and desk research results, we observed that multi-country projects do not have specific funding allocations for Indonesia. That is probably conditioned by either country-specific challenges in the energy sector or complexities related to the implementation of large multi-country projects by international AEs.

The GCF does not have mechanisms to monitor the cost of funds covered by final beneficiaries via loans or other financial instruments, which means that intermediary financial institutions can easily add on margins that can lead to significantly high funding costs.

3. Suitability and effectiveness of GCF Secretariat support in the approval and implementation processes of energy sector projects

The main issues in this area that were highlighted by interviewees are delays in project kick-off and implementation timelines, which put at risk the timeliness and thus the scale of project impacts on and contributions to climate action. During interviews, it was highlighted, however, that the accreditation (as well as reaccreditation) processes are lengthy and unnecessarily cumbersome.

Different stakeholders (including civil society organizations [CSOs], private sector representatives and others) confirmed that the GCF's role and mandate in climate action – and specifically in the energy sector – is extremely important; however, many of them highlighted unsurmountable challenges related to project approval at all stages, including the concept note approval and funding proposal approval stages.

Although both national AEs (Kemitraan Bagi Pembaruan Tata Pemerintahan and PT SMI) work actively towards building a project pipeline, they do not yet have approved GCF projects for multiple reasons, such as unclear GCF priorities in terms of subsectors, technologies and project design modalities and – most importantly – slow GCF revision and approval processes.

a. GCF approach to project origination

The GCF communication process and channels are not perceived as very efficient by interviewees. More specifically, response times to questions, requests and report revisions in the process of project origination and implementation are quite lengthy. The issues highlighted are not primarily related to knowledge or human capacity aspects but rather to slow responses and the involvement of too many parties in communications and related issues, which hinder the overall project implementation life cycle.

Another issue pointed out by interviewees is the possible lack of experience in grass roots projects among GCF team members, which creates challenges at the concept note revision stage. Specifically, as highlighted during interviews, proposals for projects to be established from scratch as well as those introducing new technologies have a much lower approval success rate.

b. Work of the GCF with relevant energy sector stakeholders, including the network of AEs and executing entities

All interviewees were aware of GCF activities and often referred to activities implemented by the country NDA (with strong support from the GGGI team), including project pipeline development activities.

The NDA of Indonesia initiated a comprehensive process targeted at developing a GCF project pipeline in 2019. Specifically, in the framework of the GCF readiness grant (being implemented by GGGI), a call for proposals was initiated for GCF projects. The NDA invested significant effort (with the support of GGGI under the framework of the readiness activity RPSP 1803-15143); a dedicated website on the application process was introduced, a simplified template for applications was developed, and training on concept note application processes was conducted.

As a result, around 300 project ideas and concept notes were received and shortlisted with the help of dedicated expert reviewers. The NDA provided training to those whose concept notes were shortlisted under RPSP activity 1803-15143. This activity was followed by a matchmaking activity with potential national and international AEs. So far, the initiative is perceived very positively by different stakeholders (private sector, CSOs, government agencies and others) since it increased awareness about the GCF and the opportunities that it offers to the Indonesian market.

The benefits of this approach were pointed out not only by national stakeholders but also by international AEs and other stakeholders.

It is worth mentioning, however, that there is already enough interest and willingness to cooperate with the GCF, especially among private sector representatives.

c. Compliance of GCF energy sector projects with GCF environmental and social safeguards

The results of the desk review indicate that energy sector projects overall comply with GCF environmental and social safeguards, as highlighted in the projects' annual performance reports. However, stakeholders face certain challenges and incur costs in terms of complying with the GCF environmental and social safeguards since they are usually materially different from those required at the country level. Often, when the AE is a multilateral development bank (MDB) or a donor agency, compliance is more complicated because of the additional layer of requirements. For instance, MDB and donor agency AEs often have their own environmental and social safeguard requirements that add another layer of requirements and further complicate compliance (e.g. FP083, FP156).

d. Assessment of the human capacity of the GCF Secretariat to support energy sector projects throughout their life cycle

Several interviewees mentioned that, in their opinion, the GCF was short-staffed; many came to this a conclusion due to delayed responses from GCF staff at different stages of engagement. Additionally, a few respondents highlighted that there is a lack of knowledge among GCF staff when it comes to grass roots projects and advanced innovative technologies in the energy sector. Specifically, interviewees referred to project proposals where, for example, the company or the project/programme had to be established/initiated from scratch and/or was intended to introduce

technologies that are either non-existent or not popular in the Indonesian market (e.g. green hydrogen).

Most interviewees were not aware of the content or even existence of GCF sectoral guidance in the energy sector.

Several interviewees mentioned that due to the fast advancement of technologies in the energy sector as well as the need for different technologies in different locations of Indonesia (different islands have different issues and challenges in the energy sector), GCF energy sector approaches (both in terms of guidelines and staff capacities) should be periodically revised, broadened and adjusted to regional needs to the extent possible.

e. GCF policy and governance framework in the energy sector

Many interviewees were not very aware of the GCF policy and governance framework and instead highlighted complexities in GCF governance practices (including those in the decision-making processes).

It should be noted, however, that the NDA pipeline development activities were perceived by interviewees as rather effective and efficient. Energy sector project initiation activities were especially effective as they served to generate several proposals in the pipeline, as mentioned during interviews. However, the IEU does not have access to the pipeline developed during this process.

f. Comparison of GCF energy sector investment cost-effectiveness with those of the private sector and/or other public finance institutions or development agencies

GCF energy sector investments are definitely cost-effective, which was highlighted by several interviewees. Moreover, GCF funding is perceived as affordable and concessional, especially when it comes to investments that are not yet commercially viable and thus are not financed by traditional commercial funders (e.g. commercial banks or other financial institutions). This is especially relevant for private sector projects (via loans) since the GCF funding rate is lower compared to not only commercial funding (e.g. deposits, bonds) but also funding from MDBs (e.g. the International Finance Corporation, ADB).

It is worth mentioning that some interviewees expressed the opinion that operational costs (prior to project approval as well as during project implementation) are higher compared to other multilateral funds, specifically the costs incurred during concept note preparation. Proposal writing costs are high and include the costs of internal human resources, consultants and, most importantly, the costs of not launching projects on time due to long approval times.

4. Sustainability of the results and approaches of GCF interventions in the context of global and Indonesian energy sector specifics

a. Sustainability of the outcomes of GCF interventions in the energy sector

Since energy sector investments have not yet been implemented, it is difficult to assess their sustainability. Still, it can be mentioned that the design of the following outcomes is deemed sustainable:

- FP083: Geothermal power stands out as a reliable form of baseload energy, without the intermittent nature and variability commonly associated with many other renewable energy sources. When favourable conditions are met, geothermal power can compete with coal or natural gas in terms of cost, thus reducing a country’s reliance on imported fuels and enhancing its energy security.

Being an environmentally cleaner source of electricity, geothermal energy can play a significant role in reducing carbon emissions in the power sector and advancing a nation's climate change objectives. It also has the potential to contribute to **increasing electricity access, economic growth, jobs creation and prosperity**, particularly in regions with lower electrification rates and higher poverty levels, such as Indonesia's eastern islands.

- FP196: Local job creation – especially green jobs – and income generation are major economic benefits, in addition to energy savings in industry. The employment of professional and administrative human resources to install, manage, monitor, evaluate and maintain energy-efficient appliances and equipment in factories and plants is a good example of green jobs. Creating jobs assumes considerable economic impacts, given a pool of several hundred energy managers and 30 energy service companies registered across Indonesia. The emergence of new and sustainable green jobs will relieve unemployment as well as scale up and replicate project benefits.

b. GCF approach to innovation, replication and scaling-up interventions to support a transformation and paradigm shift in Indonesia

Clean energy technologies and solutions are evolving very rapidly in the country, and the GCF is perceived as a pioneer, investing in innovative technologies and solutions in the energy sector and in general climate action related technologies to ensure innovation, replication and scalability in its interventions.

According to interviewees, stakeholders often encounter situations and cases wherein innovative energy sector technologies and solutions are not approved by the GCF. Moreover, there are no clear-cut guidelines or eligibility lists to refer to in order to assess whether this or that technology is eligible. According to interviewees, the assessment of technologies and their feasibility is subjective and different reviewers can have different (sometimes even contradictory) opinions regarding them.

Green hydrogen, sustainable biomass and innovations in energy storage technologies were highlighted by interviewees as those most relevant for Indonesia; however, the approval of proposals that include innovative technologies is often delayed and prevents applicants from proceeding to the investment stage. Most interviewees assume that the delays are caused by a lack of understanding and knowledge about the above-mentioned energy sector technologies, processes that are not streamlined, and too many GCF parties being involved in the process.

5. Coherence between the GCF climate finance delivery with other multilateral entities

a. The GCF's comparative advantage compared to other multilateral funds in the context of the energy sector

The major benefits of the GCF compared to other multilateral funds were highlighted by many interviewees as follows:

- The low cost of funding (the GCF offers concessional interest rates that are considerably lower than the market rates in Indonesia and sometimes lower than those offered by other multilateral funds)
- The availability of grants (GCF project grants and grant components foster the implementation of commercially unfeasible energy sector projects in the short term)

- Opportunities to benefit from readiness projects to prepare for project implementation in the energy sector (including training, capacity-building programmes, and support throughout concept note and funding proposal development)
- Alignment of projects with the country's NDC (energy portfolio projects were fully aligned with the NDC)
- The big funding window (compared to other countries) to obtain financing for climate projects in Indonesia

b. Effectiveness of the GCF's additionality in energy sector projects

The additionality of GCF energy sector projects is characterized by the fact that the GCF pioneers investments in advanced technologies in the clean energy sector (e.g. potential investments in geothermal energy under FP083). Also, the potential size of investments, the GCF's appetite for high-risk investment, the deployment of GCF grants, TA, and guarantees to leverage ongoing and new projects working through a direct access entity are also additionalities that the GCF brings, especially when it comes to the energy sector of Indonesia (given the size of the country and the volume of investments needed in the energy sector).

c. GCF results area(s) and sectoral guidance compared with the sectoral approaches or classifications of other climate funds and multilateral banks

Interviewees were not very aware of the GCF sectoral guidelines. Some interviewees who were acquainted with the guidelines and who have experience with other multilateral funds mentioned that the latter's sectoral guidance classification requirements are more flexible, streamlined, effective and efficient. More specifically, the guidelines and similar documents of other multilateral funds clearly define eligibility criteria, including eligible technologies, business models, and operational and implementation mechanisms, which facilitates processes and creates clear expectations.

6. GCF ENERGY SECTOR PROJECT APPROACH REGARDING GENDER EQUALITY AND INDIGENOUS PEOPLES

a. Gender equality and Indigenous Peoples considerations in energy project results

Gender action plans include adequate actions and measures incorporating considerations of women at all stages of project design and delivery. Women are considered project stakeholders, workers and end users (or beneficiaries). Indicators cover such aspects as women's enterprise development, women's professional and skills development in vocational activities relevant to the sector (e.g. engineers, maintenance and services), and community dialogue in support of women's empowerment initiatives.

b. Implementation, monitoring and reporting of gender action plans and related co-benefits

As mentioned above, projects have clearly defined gender action plans. However, since the plans are not yet being implemented, it is difficult to assess the feasibility of implementing them.

c. Actions related to Indigenous Peoples

Actions related to Indigenous Peoples were not observed. Some project activities are assessed against the International Finance Corporation's Performance Standard 7 on Indigenous Peoples (e.g. FP151, FP099, FP152); however, we did not observe any cases where such standards are required.

7. The extent of country ownership towards GCF investments in the energy sector

a. Inclusion of GCF energy sector investments in the NDC implementation plan

To meet Indonesia's NDC goals, which are aimed at reducing greenhouse gas emissions by 29 per cent using solely domestic resources or by 41 per cent with additional international assistance, it is projected that investments of approximately USD 247 billion are required over the 2018–2030 period. This equates to an annual investment of roughly USD 19 billion. The budget allocated by the State for climate change mitigation is approximately USD 5.7 billion per year, covering only around 30 per cent of the financial requirements to achieve the NDC targets. While the Government of Indonesia has taken steps to enhance domestic climate financing, it remains crucial for the country to secure international climate funding and private sector investments to bridge the investment gap.

The Government of Indonesia considers the GCF as a reliable source of funding to achieve its NDC goals. The national priorities outlined in the GCF CP are a summary from the National Medium-Term Development Plan, the Presidential Regulation for a National Action Plan For Reducing Greenhouse Gas Emissions, Indonesia's nationally appropriate mitigation actions and – most importantly – Indonesia's NDC.

b. Stakeholder project ownership and the sustainability of results in the energy sector

The results of interviews with different stakeholders (including representatives of government, AEs and other stakeholders) indicate that there are challenges related to multi-country project modalities. Specifically, there is very often no clear local stakeholder ownership of multi-country projects (e.g. FP151, FP152). Although project results and progress are periodically reported to the GCF as well as to a certain extent to the NDA, clear country-level commitments and implementation are missing.

c. Inclusion of subnational stakeholders in activities

The NDA's activities on stakeholder pipeline development often involve subnational representatives (e.g. municipalities), and project portfolio activities also include subnational stakeholders (again, municipalities).

8. Fostering technical innovation and the deployment of diverse financial instruments in the energy sector by the GCF

a. The GCF's catalytic role in promoting innovative approaches to crowd in climate finance in energy investments to achieve climate goals

The GCF's catalytic role in investing in innovative approaches and attracting climate finance in the energy sector of Indonesia is evident and cannot be underestimated. However, complex and lengthy approval processes, unrealistic timelines and unclear eligibility criteria slow investments and deter other climate finance investors from actively cooperating on GCF projects. This is especially

relevant for private sector financiers. Specifically, investments in the private sector have stricter timelines (compared with public sector investments); thus, investors expect prompt investment decisions from the GCF.

On the other hand, the GCF plays an important role in the Indonesian market when it comes to investments in energy sector innovative solutions and technologies (FP083) as well as innovative financing solutions (FP156, FP196), among other things.

Many of the portfolio projects contain innovative technological solutions, business models and delivery mechanisms.

b. Innovative technologies and business models

The Shire Oak project, known as FP099, 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, whereas 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 model in Indonesia.

CIO investment in Shire Oak Indonesia will not only boost investments in the C&I sector in Indonesia but also contribute to the development of a new C&I business model in the country by fostering the adoption of solar energy nationwide. Furthermore, CIO investment in the Shire Oak project will bring expertise, employment opportunities and benefits to local communities through a community development programme.

c. Innovative financing mechanisms

FP083 will offer financial mechanisms to address the primary obstacle to geothermal development, which is the uncertainty associated with geothermal resources. This project encompasses a risk-mitigation facility designed to confirm geothermal resources and includes exploration, delineation, test drilling and technical support. GCF funds will be utilized to provide favourable financing options to public developers through soft loans to invest in convertible bonds issued by private developers through GCF reimbursable grants. Drilling-related risks are mitigated by the level of concessionality and the specific characteristics of the GCF reimbursable grant.

9. The extent of GCF energy sector investment replicability and scalability with the objective of transforming the market

The design of most portfolio projects can trigger scalability. More specifically, financing mechanisms (e.g. those used in FP083, FP099, FP152 and FP196) can attract considerable financing resources for investing in energy sector financing as well as risk mitigation thereof, and technologies (e.g. geothermal in FP083) can serve to pioneer the introduction of new or not yet economically viable technologies into the Indonesian market.

Since most energy sector projects are not very advanced, it is still too early to speak about the uptakes, second phases or policy changes.

C. Emerging lessons for the GCF

The following emerging lessons for the GCF can be drawn from Indonesia country case study:

- The energy sector of Indonesia is very complex, and thus the transition towards clean energy has many challenges. To address those challenges, an **innovative approach might be needed**. Although GCF energy sector projects include many innovative solutions and technologies (as

described herein), until now the GCF has not supported newly emerging innovative energy sector solutions (e.g. green hydrogen, sustainable biomass, innovations in energy storage technologies) or the electricity infrastructure thereof (including transmission and grid infrastructure), which are paramount for greening the energy sector.

- **The GCF processes related to project initiation, approval and management are perceived as slow and inefficient** by Indonesian stakeholders, and thus to negatively impacts the effectiveness and efficiency of energy sector projects. Complex processes related to project modifications are also a big challenge (interviewees often mentioned that they would not attempt project modification/restructuring since they expect it will take a long time to obtain approval). This is especially relevant for energy sector projects in Indonesia (sometimes probably driven by a certain level of complexity) since it considerably reduces the impact potential of projects, their timeliness and their technology relevance. Frustrations related to delays in project approvals can potentially decrease interest in and motivation for applying for GCF funding as well as trigger reputational challenges for the GCF.
- **The planning process of country-level activities of large multi-country projects** is not well designed or organized. Although there are certain interactions between the NDA and the multi-country AEs, the country-level commitments, timelines, indicators and reporting are not in place since the NDA has no mechanism requiring country-level allocations.

APPENDIX 2–1. LIST OF INTERVIEWEES

FULL NAME	FUNCTION	AFFILIATION
Noor Syaifudin	Senior Policy Analyst	NDA Fiscal Policy Agency
Achala C. Abeysinghe	Asia Director and Head of Programmes	GGGI
Jaeseung Lee	Country Representative	GGGI
Vidya Fauzianti (with other team members)	Project Manager	GGGI
Rahman Soeryo Anindito	Project Manager	PT Indonesia Infrastructure Finance
Rama Aditia	Project Secretary	PT Indonesia Infrastructure Finance
Eria Dewi Mardhawati	Product Development Team Leader	PT Indonesia Infrastructure Finance
Y. Bayu Wirawan	Managing Director, Investment Directorate	PT Indonesia Infrastructure Finance
Henky Wilmar (with other team members)	Manager for Offshore Funding and Grants, Corporate Finance Division	PT Perusahaan Listrik Negara
Abimanyu S. Aji (with other team members)	Climate Finance Programme Manager	Kemitraan Partnership
Laode M. Syarif	Executive Director	Kemitraan Partnership
Septia Buntara Supendi	GCF Programme Manager	ASEAN Centre for Energy, Indonesia
Rio Jon Piter Silitonga	Energy Efficiency Analyst	ASEAN Centre for Energy, Indonesia
Shania Esmeralda Manaloe	Associate ASEAN Plan of Action for Energy Cooperation Officer	ASEAN Centre for Energy, Indonesia
Fakhul Aufa	Head of SDG Indonesia One Team Leader Strategic Partnership and Business Development	PT SMI
Puti Faranizaq	Public Sector Financing Division	PT SMI
Muchsin C. Abdul Qadir	Energy Specialist, East Asia and Pacific Region	WB
Sylvain Taboni	Corporate Social Responsibility	BMP Paribas
Ryan Oetema	Senior Investment Manager	CIO
Mujib Fatan	Project Manager	EDF Indonesia
Mathieu Geze	Director Asia	HDF Energy
Ryando Perdana	Project Manager of Solar PV	PT Supraco Indonesia, Radiant Utuma Group
Nurul Fadila	Marketing Manager	PT Supraco Indonesia, Radiant Utuma Group

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

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3. MONGOLIA COUNTRY CASE STUDY REPORT

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TABLES

BOXES

A. BACKGROUND AND CONTEXT

This report summarizes the results of the Mongolia country case study that was conducted under the framework of the Independent Evaluation of the GCF Energy Sector Portfolio and Approach. This case study provides important evidence on the results achieved (including unintended results) by GCF funded activities in the energy sector; the GCF's competitive advantage in the country context; the coherence of GCF objectives at the country level, including the role of CPs in supporting energy sector objectives; and country-level perspectives on GCF support related to innovation.

This report is based on the results of a desk review, interviews (see Appendix 3–1), and a country mission undertaken from 15 to 19 May 2023, including sites visits to the Green Building FP 077 and the MSME Business Loan Programme beneficiary under FP028. The country mission team included Lilit Gharyan (Econoler consultant) and Genta Konci (GCF-IEU). Within one week, more than 60 interviews with key stakeholders were conducted; however, there were limitations around visiting project sites, mostly due to the geographical remoteness of project sites from the capital and the scarcity of viable sites with demonstrated tangible outcomes.

1. COUNTRY CONTEXT

Table 3–1. Overview of Mongolia's country context

CATEGORY	COUNTRY
Demographics	The total population of Mongolia is 3,255,468 (2023 est.), with 69.1 per cent of the population living in urban areas and 30.9 per cent living in rural areas. Mongolia is one of the least densely populated countries in the world, at a density of two people per km^2 (Central Intelligence Agency, 2023). In all, 28.4 per cent (2018) of the population lives below the national poverty line (Central Intelligence Agency, 2023).
GCF group status	Asia Pacific
Governance conditions	As evaluated by the WB's six governance indicators (2021), Mongolia ranks relatively low in the Government Effectiveness (35th percentile) and Control of Corruption (34th percentile) indicators, average in the Rule of Law (46th percentile) and Regulatory Quality (45th percentile) indicators, and relatively high in the Voice and Accountability (58th percentile) and Political Stability and Action Against Violence/Terrorism (67th percentile) indicators (World Bank Group, 2023). Fragile and conflict-affected State status (World Bank, 2022): N/A. Governance: Politics in Mongolia takes place under the auspices of a semi-presidential, multiparty representative democracy. Executive power is exercised by the Prime Minister, who is the Head of Government, and the Cabinet. The President is the Executive Head of State, and the current President is Ukhnaagiin Khürelsükh.
Economic and development conditions	Development status: Lower-middle income (World Bank, 2023b). Important economic sectors: Despite global financial tightening, high oil and food prices, and border restrictions with China, the Mongolian economy recovered in 2022. Economic growth is estimated to have reached 4.7 per cent in 2022 (up from 1.6 per cent in 2021), with real gross domestic product (GDP) surpassing its pre-pandemic level, as was the case in most other East Asia and Pacific countries. Supply bottlenecks and pressures on energy and imported food prices, combined with a significant exchange rate depreciation, resulted in high inflation. The headline inflation rate recorded an average of 15.2 per cent in 2022, up from 7.1 per cent in 2021 (World Bank, 2023a). Outlook: Mongolia's economic growth is expected to accelerate to 5.2 per cent in 2023, driven by rapid recovery in mining production resulting from the removal of

CATEGORY	COUNTRY
	border restrictions, the commencement of the Oyu Tolgoi underground mining stage, and continued recovery in services since the COVID-19 pandemic (World Bank, 2023a).
Access to finance	The banking sector assets-to-GDP ratio is another important macroeconomic indicator that can be used to assess a country's access to finance. This ratio represents the size of a country's banking sector relative to its overall economy and can provide an indication of the level of financial intermediation and access to credit. Microfinance: Mongolia has a well developed microfinance sector with a number of microfinance institutions (MFIs) providing small loans and other financial services to individuals and small businesses. According to the Microfinance Information Exchange, there were 22 active MFIs, with a total loan portfolio of over USD 590 million, as of December 2020. Capital markets: Mongolia has a relatively small and underdeveloped capital market with limited access to long-term financing. However, the government has been taking steps to develop the capital market, including through the establishment of a stock exchange in 1991 and the issuance of sovereign bonds in international markets. A significant constraint for private sector financing is the cost of capital: the prime lending rate of commercial banks is 16.4 per cent (31 December 2021 est.) and the central bank discount rate is 11 per cent (31 December 2021). Private sector financing: The banking sector remains the dominant player in the financial system. Non-banking financial institutions, such as insurance companies, MFIs, and savings and credit cooperatives, remain small in terms of asset size. There is no corporate bond market. The equity market is more of a trading venue for shares and does not play a significant financing role. Private sector loan tenors average at 28.5 months, and the average deposit and lending rates are 13.0 per cent and 18.8 per cent per annum, respectively.

2. ENERGY SECTOR CONTEXT

In Mongolia, the power market is predominantly under State ownership, and the electricity grid is regulated, with no immediate plans for deregulation. However, there are challenges in the power sector due to ageing power facilities that have exceeded their expected lifespan. As a result, the power supply is unreliable, and the system experiences significant losses of over 30 per cent.

The demand for electricity has been increasing steadily due to population growth and economic expansion driven by mining activities. Over the past 10 years, the total installed capacity of the Mongolian energy system has more than doubled, rising from 538 MW in 2001 to 1,239.8 MW in 2018. Energy consumption also saw an average annual growth of 5 per cent during that period.

The energy system is divided into four separate systems: these being the Central, Eastern, Western and Altai-Uliastai Integrated Systems. These systems are not interconnected, and power is transmitted through a vast network spanning 41,726 kilometres (International Energy Agency, n.d.).

The key challenges of the energy sector are, on the one hand, continuously growing energy demand and, on the other hand, high levels of inefficiencies in power infrastructure, including high energy losses in transmission and distribution networks as well as in the industrial and building sectors.

a. Energy matrix

Mongolia's energy supply mix is dominated by fossil fuels, particularly coal. According to the International Energy Agency, coal accounted for around 84 per cent of Mongolia's primary energy supply in 2019, followed by oil at 11 per cent and renewable energy sources (mainly hydro and

wind power) at 5 per cent. However, Mongolia has significant renewable energy potential, particularly in wind, solar and hydropower, and has been taking steps to diversify its energy mix.

In terms of end uses, the majority of Mongolia's energy consumption is attributed to the residential and commercial sectors, which account for around 48 per cent and 24 per cent of total energy consumption, respectively. The industrial sector accounts for around 23 per cent of total energy consumption, and transportation accounts for around 5 per cent.

The main driver of energy consumption in Mongolia is space heating, particularly in the winter months when temperatures can drop below -40°C in some parts of the country. Many households rely on traditional stoves and boilers that burn coal or biomass, which contributes to indoor air pollution and health problems. There is significant potential for improving energy efficiency in buildings and reducing energy consumption in the residential and commercial sectors.

In the transportation sector, most vehicles in Mongolia are powered by diesel fuel imported from Russia. The country has been taking steps to promote the adoption of electric vehicles and reduce dependence on imported oil, including through the development of electric vehicle charging infrastructure and the introduction of incentives for electric vehicle purchases.

b. Sustainable development in the energy sector and related policies

Table 3–2. Sustainable energy policies and strategies

STRATEGY	STATUS	BRIEF DESCRIPTION
National energy policies	Enacted	The Mongolia State Policy on Energy 2015–2030 provides a framework for the development of the energy sector (Mongolia, n.d.). The policy is aimed at ensuring reliable and sustainable energy supply, increasing energy efficiency, reducing GHG emissions, and promoting the use of renewable energy sources. The policy establishes interim and final goals in two stages: • The first stage, for the 2015–2023 period, is focused on developing energy safety and backup power capacity, establishing foundations for the development of renewable energy, and improving the legal environment for the renewable energy sector. • The goals of the second stage, for the 2024–2030 period, are to export secondary energy and develop the sustainable renewable energy sector. The priorities of the energy sector development policy are as follows: • Reliability and safety of energy supply • Efficiency and productivity • Environmental sustainability and green development The policy outlines specific strategic goals and objectives for the energy sector, such as the following: • Increase electricity generation capacity: The policy aims to increase the country's electricity generation capacity from its current level of 1,142 MW to 8,000 MW by 2030. This will be achieved through the development of new power plants, including those based on renewable energy sources. • Develop renewable energy sources: The policy sets a target of generating 20 per cent of the country's electricity from renewable energy sources by 2020 and 30 per cent by 2030. The government promotes the development of wind, solar, hydropower and geothermal energy projects. • Improve energy efficiency: The policy aims to reduce the country's energy consumption by 20 per cent by 2020 and 25 per

STRATEGY	STATUS	BRIEF DESCRIPTION
		cent by 2030 through the implementation of energy efficiency measures in various sectors, including in buildings, transportation and industry. • Promote energy exports: The policy is aimed at promoting the export of energy to neighbouring countries, including China and Russia. The government supports the development of cross-border energy infrastructure such as transmission lines and pipelines. • Ensure energy security: The policy is aimed at ensuring energy security by diversifying energy sources and promoting the use of domestic resources. The government encourages the exploration and development of the country's coal, oil and gas reserves.
Updated NDC	Submitted in 2020	Mongolia submitted its first NDC in 2015 and an updated NDC in 2020 (Mongolia, 2020). The updated NDC includes the following key elements: • Mitigation targets: Mongolia has set a target to reduce its GHG emissions by 22.7 per cent below its business-as-usual scenario by 2030, excluding land-use, land-use change and forestry. This target is conditional on receiving international support to secure financing, technologies and capacity-building. • Adaptation measures: The NDC identifies key sectors that are vulnerable to the impacts of climate change, including agriculture, water resources and infrastructure. Mongolia has outlined a number of adaptation measures, such as improving early warning systems for natural disasters, developing climate-resilient crop varieties, and enhancing water management practices. • Renewable energy: The NDC emphasizes the importance of developing renewable energy sources to reduce GHG emissions and enhance energy security. Mongolia has set a target to increase the share of renewable energy in its total primary energy supply to 20 per cent by 2023 and 30 per cent by 2030. • Forest conservation and reforestation: The NDC highlights the importance of conserving and enhancing Mongolia's forests to mitigate climate change. The country has set a target to increase forest cover by 100 million trees by 2030. • International support: The NDC recognizes the need for international support to achieve its mitigation and adaptation targets, particularly in the areas of finance, technology transfer and capacity-building.
NAP	Developed	Mongolia's NAP identifies several key risks and vulnerabilities associated with climate change and proposes a range of adaptation actions to address these. Some of the key risks and vulnerabilities identified in the NAP are as follows: • Water scarcity: Mongolia is particularly vulnerable to water scarcity due to its arid climate and reliance on glacier-fed rivers. • Land degradation and desertification: Mongolia's vast grasslands are at risk of degradation and desertification due to a combination of climate change and human activities such as overgrazing. • Extreme weather events: Mongolia is experiencing more frequent and severe extreme weather events including droughts, floods and winter storms. • Health impacts: Climate change is expected to have significant impacts on public health, including increased incidences of heat stress, air pollution and infectious diseases.

STRATEGY	STATUS	BRIEF DESCRIPTION
		• Biodiversity loss: Mongolia is home to a rich array of biodiversity, but climate change poses a significant threat to many species and ecosystems. The NAP proposes the following adaptation actions: • Improving water storage and management infrastructure • Promoting water conservation and efficiency measures • Developing drought-resistant crops and livestock breeds • Promoting sustainable land-use practices • Restoring degraded land • Developing early warning systems for dust storms • Enhancing early warning systems and preparedness for disasters • Developing climate-resilient infrastructure • Promoting climate-smart agriculture and livestock practices • Developing heat action plans • Improving air quality monitoring and management • Strengthening health systems to respond to climate-related health risks • Promoting the conservation and restoration of key ecosystems • Developing climate-resilient livelihoods for local communities • Enhancing monitoring and research on biodiversity and ecosystem services
Long-term strategy	Submitted 2020	Mongolia has developed a long-term strategy for 2050 that outlines the country's approach to reducing GHG emissions and adapting to the impacts of climate change. The key elements of the strategy include the following: • Mitigation: The strategy sets out a goal of reducing GHG emissions by 22.7 per cent by 2030 compared to business-as-usual scenarios. By 2050, the country aims to achieve carbon neutrality, which means balancing the amount of carbon emissions produced with the amount sequestered or offset. The strategy outlines a range of measures to achieve these targets, including promoting renewable energy, improving energy efficiency, and reducing emissions from the transport and agriculture sectors. • Adaptation: The strategy also includes measures to help Mongolia adapt to the impacts of climate change, such as droughts, extreme weather events, and changes in the timing and intensity of precipitation. These measures include improving water management, promoting sustainable land-use and enhancing the resilience of critical infrastructure. • Cross-cutting issues: The strategy also addresses cross-cutting issues such as capacity-building, public awareness and international cooperation. It recognizes that achieving the goals of the strategy will require collaboration and coordination across different sectors and levels of government as well as engagement with civil society, the private sector and international partners.

c. Institutional roles and responsibilities in the energy sector

All Mongolian power plants are State-owned and divided equally among the Ministry of Energy, the Ministry of Finance and the State Property Committee. Several operating companies operate and

manage the power plants as well as transport and distribution grids, most of which are State-owned, with others based on public–private partnerships.

The Energy Regulatory Commission was established in 2009 with the purpose of achieving efficient operation and management of power plants and installations as well as securing proper maintenance. The Energy Authority is responsible for the operation of all power plants in Mongolia and the supervision of all operating companies.

The Energy Regulatory Commission regulates energy generation, transmission, distribution, supply and dispatching. It approves prices and tariffs, awards licences to operators, and monitors compliance with the terms and requirements of licences. Furthermore, it is supposed to equally protect the rights of both consumers and licensees according to the relevant laws, regulations and codes of the Energy Regulatory Commission, enacted by the Energy Law.

3. GCF ENERGY SECTOR PORTFOLIO

Mongolia developed its GCF CP in 2019. The programme outlines Mongolia's climate profile and climate change response. It further describes the GCF's engagement in the country's climate agenda, including institutional arrangements, the roles and contributions of key stakeholders, the process of identifying country priorities for the GCF, and the country portfolio.

In the CP, the energy sector is among the key identified priority areas for mitigation. Specifically, the following areas are prioritized:

- Energy-efficient buildings, cities and industries: Construction, urban and industrial development
- Low-emission energy access and power generation in both urban and rural areas

Adapted supply chains and energy access for nomads and migrants are also priority areas for adaptation.

The CP brings forward the need for GCF readiness support to facilitate improved access to low-cost finance, particularly in local currency with dedicated grants, credit lines, equity participation, credit guarantees, and risk-sharing facilities with a focus on renewable energy and energy efficiency, among other sectors.

The CP also guides on how to best combine different climate action investments in line with evolving international experience and lessons learned. The programme points towards the development role of the GCF in addition to creating economy-of-scale efficiency gains if, for instance, smaller energy efficiency or power generation investments are bundled into bigger projects.

In terms of priorities and pipeline development, improving the quality and sustainability of energy sector public services (among other sectors) through increased efficiency and low-emission or green solutions are among the key areas.

In 2023, Mongolia is preparing its second CP and is currently planning consultations with different stakeholders. Learnings from the previous CP (especially around pipeline development and engagement with the government) will be considered and integrated into the formulation of the next CP.

NDA. The NDA in Mongolia is the Ministry of Environment and Tourism.

Accredited entities (AEs). In addition to international accredited entities (IAEs) and regional DAEs, Mongolia has access to two national DAEs (Table 3–3).

Table 3–3. National DAEs active in Mongolia

NAME OF DAE	DATE OF ACCREDITATION	ACCREDITATION LEVEL
The Trade and Development Bank of Mongolia (TDBM)	24 April 2020	Direct (national)
XacBank LLC Mongolia (XacBank)	10 October 2016	Direct (national)

Mongolia has received two RPSP grants in the energy sector (as presented in Table 3–4 and outlined below), approved for a total amount of USD 664,300, of which USD 618,000 has already been fully disbursed.

Table 3–4. Approved RPSP grants in Mongolia

FLUXX #	RPSP GRANT NAME	DELIVERY PARTNER	APPROVAL DATE/ STATUS
1707-14770	Scaling-up of Implementation of Low-Carbon District Heating Systems in Mongolia	United Nations Environment Programme	25 January 2018 Completed
1809-15449	Energy Savings Insurance Model Development	XacBank LLC	25 December 2019 Not started

- **1707-14770:** The aim of this readiness support is to create a FP that will facilitate the expansion of energy-efficient district heating systems in Mongolia. Additionally, it seeks to explore alternative heat supply options for *ger* areas (traditional Mongolian dwellings) while involving the private sector. The specific activities include (i) situational assessment related to existing heat supply systems and demand in selected areas; (ii) feasibility study and identification of appropriate business models and enabling environments for the investments for the use of alternative (to coal) low-carbon fuel sources (natural gas, coal bed methane, renewable energy such as geothermal, solar, etc.); and (iii) development of implementation plans and investment proposals for enhancing heating supply systems to reduce emissions thereof.
- **1809-15449:** The aim of this readiness support is to support XacBank in structuring an energy efficiency / renewable energy financing model that benefits and transforms the energy efficiency / renewable energy market in Mongolia. More specifically, the project design and the incorporation of an energy savings insurance model that comprises financial and non-financial mechanisms are structured to work together to create trust and credibility among key actors, reduce the perceived risk of energy efficiency / renewable energy projects for stakeholders, persuade clients to invest in energy efficiency / renewable energy, and generate a continuous pipeline of bankable projects.

Mongolia has received more GCF financing related to the energy sector than other Asian countries and was relatively early in accessing the GCF. To date, 10 energy projects have been approved in Mongolia for a total of USD 1,116 million in GCF financing; six of those are national projects and four are multi-country projects, as outlined below and presented in Table 3–5.

- **FP025 GCF-EBRD SEFF Co-financing Programme** (renamed as EBRD GCF Green Economy Financing Facilities [GEFF]) is a multi-country programme executed by the

European Bank for Reconstruction and Development (EBRD). GEFF Mongolia[3] provides finance and advice for households and private sector businesses to improve competitiveness through high-performance technologies and practices and supports Mongolia's green economy transition with USD 137 million in financing for energy efficiency and small-scale renewable energy investments for businesses and households. The financing partners of GEFF Mongolia are XacBank and KhanBank.

- **FP028 MSME Business Loan Programme for GHG Emission Reductions** is a loan programme executed by XacBank. The loan programme is for investments in energy efficiency / renewable energy projects by MSMEs in Mongolia. As of the end of 2022, the outstanding loan portfolio was USD 48 million (with 33 per cent being a GCF contribution).
- **FP046 Renewable Energy Programme #1 – Solar** is another loan programme executed by XacBank, through which the bank financed the first solar power plant in Mongolia, the Sumber Solar Power Plant. The project was initially planned to last 10 years (2018–2028); however, the loan was prematurely repaid by the client due to access to a cheaper debt facility, and the project was terminated.
- **FP077 Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Project (AHURP)** aims to improve the climate resilience of Ulaanbaatar City and the adaptability of Mongolia to climate change by reaching 100,000 people who will directly benefit from living in low-carbon and climate-resilient affordable housing units, living and working in improved and better adapted urban environments and more resilient and healthier urban areas. The project's AE is the ADB, and the executing entity is in the Municipality of Ulaanbaatar. The project was scheduled to take place between 2018 and 2026; however, it is significantly behind schedule. As of the end of 2022, the following actions had been implemented:
  - A project management unit was established.
  - Two consulting companies were hired.
  - The design and partial site plan for 110 housing units have been completed.
  - The detailed engineering design for the infrastructure in the initial fast-track portion of Phase 1 was completed, and procurement documents to tender this work were prepared.
  - The detailed engineering design for the secondary connection network and the one for the 110 green housing units were completed and approved by State experts.
  - The sketchbook for Sharkhad North, illustrating the architectural design and site planning for 110 housing units, was completed and approved by the Urban Development Agency of the Municipality of Ulaanbaatar.
- **FP086 "Green Cities Facility"** is a multi-country project executed by EBRD. The Facility was signed off and became effective in 2019. During some interviews, it was mentioned that EBRD works with the City of Ulaanbaatar to develop a pipeline of investments; however, there are no identified subprojects in Mongolia as of now.
- **FP099 Climate Investor One (CIO)** is a multi-country project with the Dutch Entrepreneurial Development Bank (FMO) as the AE and Climate Fund Managers B.V., Stichting Development Fund, Coöperatief Construction Equity Fund U.A., and Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden N.V as executing entities. It is a blended finance facility managed by Climate Fund Managers. CIO is mandated with delivering renewable energy at affordable prices in developing markets through its financial contribution

[3] Further details on GEFF Mongolia are available at https://ebrdgeff.com/Mongolia/.

to the early-stage development, construction and operational phases of an underlying project life cycle. The project does not yet have any investments or a pipeline under discussion for Mongolia.

- **FP153 Mongolia Green Finance Corporation (MGFC).** The MGFC's overall objectives are to contribute to GHG emission reductions and climate change mitigation in Mongolia. The MGFC will mainstream green finance for low-carbon, climate-resilient development through dedicated financing to energy intensive users and households in partnership with local financial institutions. XacBank is the AE and executing entity of the project. The project has not been initiated, because the Government of Mongolia did not approve its portion of co-financing for the MGFC's equity.
- **FP154 Aimags and Soums Green Regional Development Investment Programme (ASDIP)** will be delivered through a multi-tranche financing modality sequenced into three tranches over a 10-year implementation period: (i) climate-resilient, low-carbon and attractive Aimag and Soum centres developed; (ii) rangelands managed for climate resilience, high carbon sequestration and sustainable herding (including veterinary services, fodder production, certification and traceability); (iii) low-carbon and climate-resilient livestock value chains created and strengthened through accessible finance; and (iv) capacity and policy reforms for improved low-carbon and climate-resilient agro-territorial development. The project has not yet been launched.
- **FP204 Sustainable Renewables Risk Mitigation Initiative (SRMI) Facility (Phase 2 Resilience focus) [SRMI-Resilience]** is a multi-country project with the WB as an AE and Mongolia's Ministry of Finance as the executing entity for Mongolia. SRMI-Resilience's objectives are threefold: (i) reduce GHG emissions by tackling the lack of a sustainable and bankable pipeline for renewable energy projects in developing countries; (ii) increase the resilience of vulnerable people by providing access to modern energy to power cooling appliances; and (iii) increase the resilience of grid infrastructure by supporting the development and implementation of technical standards that encompass country-specific climate hazards. The project has not yet been launched in Mongolia.
- **SAP004 Energy Efficient Consumption Loan Programme** is a loan programme executed by XacBank. The loan programme is for investments in energy efficiency specifically in heating appliances and housing products.

Table 3–5. Funded activity portfolio in the energy sector

Project number	Name	Public/ private	Sectoral guide			AE	Approval date/status	GCF energy investments (USDm)	Total GCF budget (USDm)
			Energy access and power generation	Energy efficiency	Cities, buildings, and urban systems				
FP025	GCF-EBRD SEFF Co-financing Programme	Private	X	X	X	EBRD	14/10/2016	378	378
FP028	MSME Business Loan Programme for GHG Emission Reduction	Private	X	X	X	XacBank	12/15/2016	20	20
FP046	Renewable Energy Programme #1 – Solar	Private	X			XacBank	10/2/2017	8.65	8.65
FP077	Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Project (AHURP)	Public		X	X	ADB	28/02/2019	104.5	145
FP086	Green Cities Facility	Public			X	EBRD	20/10/2018	3	93
FP099	Climate Investor One	Private	X			FMO	20/10/2018	100	100
FP153	Mongolia Green Finance Corporation	Private		X	X	XacBank	13/11/2020	26.6	26.6
FP154	Mongolia: Aimags and Soums Green Regional Development Investment Programme (ASDIP)	Public		X	X	ADB	16/03/2021	8.75	175
FP204	Sustainable Renewables Risk Mitigation Initiative (SRMI) Facility (Phase 2 Resilience focus) [SRMI-Resilience]	Public				WB	16/03/2023	160	160
SAP004	Energy Efficient Consumption Loan Programme	Private	X	X	X	XacBank	20/10/2018	10	10

Source: IEU DataLab

B. KEY FINDINGS

1. ALIGNMENT WITH GCF MANDATE AND MONGOLIA'S ENERGY SECTOR NEEDS

Overall, interviewees confirmed that the design of energy sector projects in Mongolia is in line with the climate goals and the NDC. All projects contribute to reducing emissions, have considerable adaptation components and have strong potential for a paradigm shift. Further alignment is hindered by (i) delays in project kick-off and implementation timelines (for those that have started), which put at risk the project's timeliness and thus the scale of impact; and (ii) inadequate design of project modalities at the project design stage.

The success of the GCF's country energy sector in renewable energy and energy efficiency projects is very much dependent on Mongolia's energy sector profile, which can be broadly characterized as follows:

- Lack of transparency in the policy and regulatory environment
- Inefficient tariff rate and mechanism to invest in the energy sector
- Outdated energy systems and infrastructure (including, for example, lack of storage capacities)
- Closed energy market and weak accountability system
- Poor governance of State-owned energy sector companies

2. CONTRIBUTION TO ACHIEVING MONGOLIA'S CLIMATE GOALS

a. Likelihood of GCF energy sector projects achieving expected results

Based on interviews and desk review results, the likelihood of achieving the expected results of GCF energy sector projects (outputs) is currently low, since five out of 10 GCF projects had not been launched as of the time of writing this report. This situation is partially due to the fact that the majority of energy sector multi-country projects (FP086, FP099 and FP204) have had no activities in Mongolia. The challenges relate to the complexities to structuring and implementing multi-country projects. Another obstacle is the public debt ceiling of 80 per cent of GDP, due to which parliamentary approval is required even for relatively small projects – anything above 30 billion Mongolian tugriks – further limiting the launching of government co-financed projects.

b. Changes in the practices of the AEs and other stakeholders in Mongolia, triggered by GCF energy sector projects

The document reviews and interviews indicate that the national DAEs (XacBank and TDBM, both commercial banks) have strong capacities, systems, structures and processes in the area of sustainable finance. Although both financial institutions closely cooperate with different MDBs and international donor institutions active in the region, a lot of their institutional developments and capacities can be attributed to the GCF. Specifically, the institutional capacities in the area of sustainable finance were mostly developed as a result of the accreditation process (in both institutions) as well as in the course of project implementation (in the case of XacBank, since TDBM has no approved projects yet), as highlighted during the interviews.

Capacities were built among financial institution staff as well as the client base (in the case of XacBank). This capacity-building was specifically in the energy efficiency and renewable energy sectors since many subprojects implemented by XacBank, as well as the TDBM concept notes in the pipeline, are primarily targeted towards enhancing the energy efficiency of companies and households as well as developing the renewable energy market in Mongolia.

Not much can be said regarding other project stakeholders, because most energy sector projects either have yet to commence or are at the preliminary implementation stage.

c. Co-benefits of GCF energy sector projects in Mongolia

The following co-benefits were generally noted by stakeholders:

- Increasing emphasis on the renewable energy and energy efficiency agenda within the country
- Enhancing the involvement of the financial sector in advancing the climate action agenda, particularly in the energy sector, and facilitating the financing of renewable energy and energy efficiency initiatives (for instance, the TDBM promoted GCF accreditation to bolster the bank's credibility and market presence in Mongolia)
- Facilitating the generation of new employment opportunities and the cultivation of technical expertise through the introduction of innovative energy efficiency and renewable energy technologies
- Enabling capacity-building and fostering awareness among specific target groups and the general public (both businesses and households) about the advantages associated with energy efficiency and renewable energy technologies
- Improve access to renewable energy and energy efficiency
- Contribution to water access, management and sanitation
- Contribute to market creation, access to markets, expansion or income diversification

The co-benefits of the projects under implementation are monitored through outcome indicators tracked in APRs; however, the evaluation found some of this reporting to be incomplete and outdated.

d. Adaptation of GCF practices in energy sector interventions and investments in Mongolia

The alignment of current projects with the evolving environment and contextual circumstances (encompassing both the energy sector and country) is poor. Projects no longer relevant to the issues and needs of the countries are not being adjusted, because AEs and implementing partners are reluctant to request or introduce any modifications to project modalities due to complexities in the related GCF approval processes, as highlighted by multiple interviewees.

Other noted key reasons in project delays are as follows:

- The government did not follow through with the pledged funding (e.g. FP153, FP154).
- The COVID-19 pandemic and related socioeconomic challenges had major negative impacts.

According to some interviewees, GCF staff are proactively working with the Government of Mongolia to advance negotiations towards starting/advancing projects that are stalled or challenged by evolving contextual circumstances.

e. Major positive and negative elements contributing to or hindering the achievement of project results in Mongolia

i. Positive

There is a relatively high level of awareness among key stakeholders about GCF projects and interest/readiness to contribute to the achievement of goals targeted via those projects.

GCF funding is certainly perceived as concessional and considerably low cost and is thus an attractive source of funding.

AEs have developed adequate knowledge and capacities as a result of their involvement in GCF accreditation and other processes.

ii. Negative

Slow GCF processes, the lack of timeliness of projects (i.e. sometimes project design took place long ago), and the lack of flexibility in terms of project modifications present tremendous obstacles in terms of implementing projects (applicable to FP153, FP154).

The key motivation of commercial banks to participate in GCF projects is access to low-cost funding that can be blended with other funding sources; however, a challenge highlighted by interviewees is the high requirement to blend funds with other funding sources (50:50), which prevents projects from being financed at affordable rates given that (i) GCF funding is provided in USD and has to be converted into local currency at a cost; and (ii) the cost of funds to be blended (e.g. financial institution depositor funds) is usually much higher (applicable to FP028, FP046, SAP004).

Implementing multi-country projects remains problematic, usually due to either country-specific challenges in the energy sector or complexities related to the implementation of large multi-country projects by IAEs (applicable to FP025, FP028, FP046, SAP004).

f. Unintended positive or negative results of GCF energy sector investments

The evaluation team has not identified any unintended positive or negative results so far, mainly due to the early implementation stage of the majority of GCF energy sector projects in Mongolia.

3. Suitability and effectiveness of GCF Secretariat support in the approval and implementation process of energy sector projects

"Support" in this instance refers to readiness support, the Project Preparation Facility, portfolio management support, sector guidance notes, thematic briefs and Secretariat support. One of the main issues highlighted by the majority of interviewees is the slow speed and lack of efficiency throughout GCF processes, including both technical processes (e.g. review of concept notes, financial proposals) and processes related to monitoring, reporting and the like. According to interviewees, these issues are especially evident when compared with other MDB activities in climate action financing.

As shared by most interviewees, a few years ago the GCF held a unique position in the country as one of the rare sources of green funding, with no significant competitors. However, today the picture is different; all MDBs have major commitments to climate action and a green agenda and provide climate/green/sustainable credit lines to financial institutions. Although GCF interest rates are highly attractive, interviewees point to issues such as flexibility in adjusting eligibility criteria to meet market realities, the requirements of reporting processes, assessment of proposals (e.g. contradictory feedback from representatives of different units) and other process-related challenges. A few interviewees mentioned EBRD as one of the most flexible and efficient partners when it comes to climate finance and international financial institution financing in general.

Another finding is that multi-country projects are not successful due to complexity, different partner-country priorities and lack of project contextualization, all of which are very important in the energy sector. Multi-country projects benefit from the services of IAEs to increase the concessionality of investments; however, projects are usually standardized for all countries, and country consultations do not result in much-needed project modifications.

Another issue is the absence of accredited public sector entities in Mongolia, which might prevent the public sector from implementing projects. Since the energy sector is fully public, this might be an additional obstacle for the GCF in terms of effectively implementing future energy sector projects.

Readiness projects are also a good tool to prepare for energy projects. However, the central government very often does not have much control over the readiness project delivery partner, the Global Green Growth Institute, which can lead to duplication of work and other inefficiencies in the implementation of readiness projects.

The next CP should be focused more on innovative approaches, and adaptation activities should be emphasized. More specifically, it should cover (i) the application of more innovative approaches and technologies in the energy sector (e.g. green hydrogen solutions, modernization of transmission and distribution networks); (ii) innovative financial instruments (e.g. guarantees, change of co-financing mechanisms); and (iii) reliance on a business model approach rather than pipeline approach.

a. GCF approach to project origination and its alignment with the needs of the energy sector in Mongolia

Another hurdle during project initiation stems from the government's insufficient dedication and limited aspirations for reforming the energy sector and aligning its operations with the country's NDC goals.

A primary challenge revolves around project timeliness, and frequent delays in project execution jeopardize the ongoing relevance of these initiatives.

Another concern revolves around the country's frequent changes in government, resulting in shifts in government priorities in the energy sector. Strong political influence, especially when it comes to the energy sector, may lead to politically driven, short-sighted planning and decision-making and the absence of a long-term vision in the energy sector. All of this has a negative impact on GCF project origination and alignment with the needs of the energy sector.

Overall, interviews indicate that GCF project origination is cumbersome and slow processes, which is yet another impediment in terms of project efficiency and relevance.

b. Work of the GCF with relevant energy sector stakeholders, including the network of AEs and executing entities

Although feedback from stakeholders regarding their involvement in the CP consultation process was overall positive, the involvement of important energy sector stakeholders (e.g. Ministry of Energy, Energy Regulatory Commission, large-scale donor-funded programmes) seems to be low and inconsistent. Simultaneously, it is worth mentioning that some IAEs are active players in the energy sector in the country (e.g. ADB).

Another issue highlighted by several stakeholders is the institutional arrangements of public sector project approval processes at the government level, including the NDA being under the auspices of the Ministry of Environment and Tourism.

c. Compliance of GCF energy sector projects with GCF environmental and social safeguards

The projects in the implementation stage comply with GCF environmental and social safeguards, as highlighted in the projects' APRs. More specifically, in projects FP025, FP028, FP046 and SAP004 (all of them credit lines in financial institutions), the financial institutions have in place environmental and social policies (covering labour, health and safety, and related matters) and

environmental and social management systems (integrating environmental and social risk assessments into the core credit risk management processes).

d. Assessment of the human capacity of the GCF Secretariat to support energy sector projects throughout their life cycle

As mentioned earlier, the GCF communication process and channels are not perceived as very efficient by interviewees. More specifically, response times to questions, requests and report revisions take quite a long time, according to interviewees. The issues highlighted are not primarily related to knowledge or human capacity aspects but to slow responses and the involvement of too many different parties in communication and related issues, which hinder the overall project implementation life cycle. Several interviewees mentioned that this could be a consequence of the GCF being short-staffed and experiencing high staff turnover. Several interviewees also pointed out that there is often a lack of understanding among GCF staff regarding country-specific issues, including matters related to the energy sector, the financial sector, governance and other areas.

e. GCF sectoral guidance in the energy sector

Mongolia stakeholders agree that the GCF's energy sectoral guidance and, in general, its energy sector approach limit energy sector activities since they do not encourage investments in transmission and grid infrastructure, which is a bottleneck in terms of developing the renewable energy market, not only in Mongolia but also in many other countries.

f. Policy and governance framework of the GCF in the energy sector

Many interviewees were somewhat aware of the GCF policy and governance framework, and highlighted the complexities in governance frameworks (including those in decision-making processes).

Some interviewees found the Ministry of Economy and Development to be positioned higher in the decision-making hierarchy, which is not always as effective as the engagement of other line ministries (in this case the Ministry of Energy).

Concerns were raised specifically regarding the fact that the Ministry of Economy and Development has a tendency of prioritizing projects based on their economic performance and rejecting/delaying projects not considered strongly economically viable, and it lacks internal technical capacities in the energy sector.

g. Comparison of GCF energy sector investment cost-effectiveness with those of the private sector and/or other public finance institutions or development agencies

Anecdotal evidence from interviewees pointed towards GCF energy sector investments as being cost-effective. This is especially relevant for private sector projects (via loans) since GCF funding costs are materially lower compared to not only commercial funding (e.g. deposits, bonds) but also funding from MDBs. It is worth mentioning though that some interviewees expressed the opinion that operational costs (prior to project approval as well as during project implementation) are high (e.g. human resource costs were highlighted), resulting in less-competitive funding costs. The blending requirements (GCF funding has to be blended with other funding, including commercial funding) were highlighted as factors negatively impacting the cost of GCF funding.

4. SUSTAINABILITY OF THE RESULTS AND APPROACHES OF GCF INTERVENTIONS IN THE CONTEXT OF THE GLOBAL AND MONGOLIAN ENERGY SECTOR SPECIFICS

a. The GCF's approach in ensuring the sustainability and socioeconomic co-benefits of energy sector investments

One of the major economic benefits of projects being implemented is the scalability of results, which is ensured by the requirement of blending GCF funds with other funding so that greater amounts of funding are dedicated to achieving project objectives. Another important economic benefit is low-interest rates for project investments, which lower the underlying risks and enhance the probability of success. Low-interest rates usually trickle down to project final beneficiaries in the form of low-interest loans that are then translated into activities and products that bring socioeconomic benefits to MSMEs and households in Mongolia.

Low-interest rates strongly contribute to social co-benefits, especially given that loans are extended to households and MSMEs in the market.

Raising awareness about energy efficiency and renewable energy matters (including about the economic benefits of investing in specific technologies) among MSMEs and households can result in socioeconomic benefits being generated by GCF projects.

b. Sustainability of the outcomes of GCF interventions in the energy sector

Since only a small share of energy sector investments and other interventions is being implemented, it is difficult to assess the sustainability of results. We believe that the implementation of the whole CP can create sustainable outcomes in the energy sector.

c. GCF approach on innovation, replication and scaling-up its interventions to support transformation and a paradigm shift in Mongolia

Since one of the key goals of the GCF is to catalyse finance for climate solutions via transformational change, the GCF should invest more effort in terms of innovation in the energy sector and collaboration with other players. Specifically, some interviewees mentioned that there are energy sector technologies that are not covered by the GCF yet; green hydrogen technology was strongly recommended to be included in the scope of energy sector activities. It was also recommended to cooperate closer with other MDBs and donor institutions active in the Mongolian energy sector to synchronize measures, eligibility criteria and sectoral definitions as much as possible. As a result, innovation and partnership with MDBs and other partners can potentially contribute to the replicability and scaling-up of GCF interventions.

It should also be highlighted that the active energy sector projects are mostly credit lines via financial institutions that have the following paradigm shift potential:

- Scaling up energy efficiency and renewable energy financing for different segments and industries, as well as households in remote regions of Mongolia
- Raising awareness and encouraging learning by implementing a variety of knowledge products and tools
- Contributing to an enabling environment for gender-responsive green financing

5. Coherence between the GCF climate finance delivery with other multilateral entities

a. The GCF's comparative advantage over other multilateral funds in the context of the energy sector

The comparative advantage of the GCF is seen in (i) the low cost of funding (the GCF offers concessional interest rates for projects with lending components, and the interest rates are considerably lower than the market rates in Mongolia); (ii) the availability of grants (GCF grants and grant components help bring commercially non-feasible energy sector projects – in the short term – to life); (iii) the opportunities to implement readiness projects, which have created a good foundation for project implementation; (iv) the alignment of GCF projects with the country's NDC goals; and (v) a large funding window to obtain financing for climate projects in Mongolia.

b. Effectiveness of the GCF's additionality in energy sector projects

The additionality of GCF projects being implemented is ensured by blending GCF funding with other sources of funding. The potential size of investments, the GCF's appetite for high-risk investments, the deployment of GCF grants, TA, and guarantees to leverage ongoing and new projects working through a DAE are also additionalities brought by the GCF.

c. GCF results area(s) and sectoral guidance compared with the sector approaches or classifications of other climate funds and multilateral banks

The results of the desk research indicate that the energy sectoral guides (e.g. energy access to power generation; cities, buildings and urban systems) provide a comprehensive overview of the context of their respective sector and the pathways and barriers to a paradigm shift, along with relevant case studies and investment criteria for impactful projects. However, certain investment criteria for each sector are broad rather than specifically technical in scope.

Interviewees demonstrated limited familiarity with the sectoral guides developed by the GCF. Those with exposure to other MDBs mentioned that the sectoral guidance, classification requirements and related processes of those entities are more flexible, streamlined, effective and efficient. Among the most effective ones mentioned were EBRD, ADB and the International Finance Corporation.

6. GCF energy sector project approach on gender equality and Indigenous Peoples

a. Gender equality and Indigenous Peoples considerations in energy project results

In some projects (FP025, FP028, FP046, SAP004), we have observed positive results in terms of mainstreaming gender equality aspects (e.g. number of women-led MSMEs, number of women employees, number of women trained). Gender action plans incorporate relevant outputs such as the share of women-led MSMEs in the loan portfolio, capacity-building and awareness-raising among women employees, MSMEs and households, as well as others. It has to be highlighted that, according to APRs, gender action plans are usually implemented and very often overperform compared to set targets (e.g. in FP028, the share of financed women-led MSMEs has exceeded its target).

b. Implementation, monitoring and reporting on gender action plans and related co-benefits

Projects have clearly defined gender action plans, and, for current projects, the implementation of gender action plans is being monitored and reported. Ongoing projects usually overperform compared to the gender action plan indicators. Based on the results of interviews, we can conclude that monitoring and reporting on gender action plans are well set up: gender indicators are periodically monitored and reported on.

For projects under implementation, gender component co-benefits are properly tracked and reported on; however, there are no indicators on the indigenous co-benefits of projects.

Based on the results of the reviews of available reports, interviews and site visits, we can state that the gender equality component of GCF energy sector projects is mainstreamed.

c. Actions related to Indigenous Peoples

The evaluation team did not observe any actions related to Indigenous Peoples.

In active projects and APRs, as well as during interviews, no actions related to Indigenous Peoples were identified.

7. Country ownership and lead on GCF investments in the energy sector

a. Inclusion of GCF energy sector investments in NDC implementation action plans

According to interviewees, GCF investments are linked to NDC implementation action plans. However, the review of NDC action plans by the evaluation team revealed that the GCF is mentioned only under one activity (Activity 1.2.3: Establish green financial mechanism to support climate change mitigation and adaptation measures and the development of financial products to support green development.). It should be noted, however, that the GCF CP for Mongolia is, overall, in line with the country's NDC goals.

b. Stakeholder ownership of implementation and the sustainability of results in the energy sector

The interviews with different stakeholders (including representatives of governments, AEs and other stakeholders) indicate that some challenges in the implementation processes of GCF projects might be related to the lack of alignment with the country vision and strategies in the energy sector and organizational challenges at the government level (e.g. frequent changes in government, lack of institutional memory, changes in strategies).

Another challenge, as highlighted earlier, is related to multi-country project modalities, in that there is very little or non-existent local ownership.

c. Inclusion of subnational stakeholders in activities

Stakeholder consultations involve CSOs that very often have representatives from the subnational level. Moreover, the executing entities for some projects are at subnational levels (e.g. FP077 – Municipality of Ulaanbaatar). Also, a high level of involvement of subnational stakeholders is ensured via, for example, civil society organization consultation processes (many regional women-led CSOs actively participate in discussions on readiness grants) and other engagements arranged by the NDA within the framework of CP developments and readjustments.

8. FOSTERING TECHNICAL INNOVATION AND THE DEPLOYMENT OF DIVERSE FINANCIAL INSTRUMENTS IN THE ENERGY SECTOR BY THE GCF

a. The GCF's catalytic role in promoting innovative approaches to crowd in climate finance in energy investments to achieve climate goals

Currently, active GCF projects in Mongolia are mainly in the financial sector with quite straightforward credit line facilities, and the products are not very innovative. The requirement to blend GCF funds with other funding sources ensures a pooling of funds to finance the energy sector of the country.

As for credit line facilities, financial institutions finance innovative and catalytic projects in the renewable energy and energy efficiency sectors. For example, the first LEED certified building[4] in Mongolia and the first solar station were financed under financial institution projects.

b. Promoting innovative product, technology and business model approaches and delivery mechanisms in the energy sector and/or other public finance institutions/development agencies by the GCF

Many of the portfolio projects contain innovative solutions, including business models (e.g. FP153) and delivery mechanisms (e.g. FP046, FP028). Some of the innovative approaches are described below. However, since many projects have not commenced or are not advanced enough, the innovative solutions have not yet materialized.

A few interviewees also mentioned that there is a lot of reliance on the pipeline approach (the project pipeline should be proven in advance) rather than adopting a business model approach that hinders innovation.

9. THE EXTENT OF GCF ENERGY SECTOR INVESTMENT REPLICABILITY AND SCALABILITY WITH THE OBJECTIVE TO TRANSFORM THE MARKET

The design of some projects contributes to the scalability and replicability of their objectives, but those projects have not been kicked off yet. For example, the MGFC can become a successful and replicable model. See the description and the current status of the project in Box 3–1 below.

Box 3–1. FP153: Mongolia Green Finance Corporation (MGFC)

The MGFC was established in 2020 and has obtained a non-bank financial institution licence from the Financial Regulatory Commission. However, the licence is presently suspended as the company remains non-operational. As a result, project initiation is pending. Current shareholders include the Mongolian Bankers' Association (70 per cent) and five banks (30 per cent).

As per feedback from stakeholders, the primary hurdle lies in the Government of Mongolia's delay in finalizing the decision to inject its pledged equity. Another challenge arises from specific regulatory modifications to banking regulations, particularly the introduction of an equity ceiling for affiliated entities. This alteration has led to a disincentive for potential investor banks to participate in the MGFC due to concerns about the economic viability of their investments.

[4] LEED (Leadership in Energy and Environmental Design) is the world's most widely used green building rating system. LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits. LEED certification is a globally recognized symbol of sustainability achievement, and it is backed by an entire industry of committed organizations and individuals paving the way for market transformation. See more at https://www.usgbc.org/leed.

Interviewees indicated that the regulatory and policy framework of the company is fully developed, positioning it for an operational launch once the necessary approvals and GCF investments from the government are secured. As suggested by interviewees, an alternative source for government investment could potentially be the Development Bank of Mongolia.

Source: IEU evaluation mission to Mongolia

Another example is the co-financing of credit lines in the energy efficiency and renewable energy sectors (e.g. FP028, SAP004 by XacBank, FP025 by EBRD). Specifically, the banks blend GCF funding with other funding sources (internal funding from deposits as well as other MDB funding sources) and on-lend the funds in the form of loans to MSMEs and households. The scalability enabling conditions of such types of projects are as follows:

- Blending requirements that enable a greater volume of funding resources
- Capacity development among financial institutions to finance climate actions and, more specifically, energy projects
- Commercialization of energy efficiency and renewable energy loans (in the medium term)
- Awareness-raising among MSMEs and households about the benefits of renewable energy and energy efficiency measures

According to interviewees, the first renewable energy power plant (Sumber Solar Power Plant) was financed via a GCF project (the FP046 loan), although it cannot be considered a full success since the loan was prematurely repaid due to certain financial issues caused by the COVID-19 pandemic.

Since most of the projects in the energy sector are not very advanced, it is still too early to speak about the uptakes, second phases or policy changes.

C. Emerging lessons for the GCF

The following emerging lessons for the GCF can be drawn from the results of this country case study:

- The GCF processes related to project initiation, approval and management are considered to be slow and inefficient, which negatively impacts the effectiveness and efficiency of energy sector projects. Complex processes related to project modifications are also a big challenge. This is especially relevant for energy sector projects since it considerably reduces their impact potential, timeliness and technology relevance.
- More flexibility in terms of revising the modalities and requirements of current energy sector projects and broadening/revising the overall scope and eligibility criteria for energy sector projects in general (e.g. in energy sectoral guides) can be beneficial for speeding up the uptake of current projects and guaranteeing the success of new projects. Financing more innovative energy sector solutions (e.g. green hydrogen) as well as financing the infrastructure thereof (including transmission and grid infrastructure) are paramount for greening the energy sector. Considering the country specifics of the energy sector and country-specific solutions based on country energy needs may also be an option.
- Relevant financial instruments, modalities and mechanisms are another important contributor to the success of energy sector projects in Mongolia. Long GCF funding maturity, for example, is critical for greening the energy sector. Another important aspect is the currency in which funding is provided since foreign exchange risks (especially in countries prone to them) are among the most sensitive and costly funding aspects that cause challenges.

APPENDIX 3–1. LIST OF INTERVIEWEES

FULL NAME	FUNCTION	AFFILIATION
David Howell	Project Development Officer, Eco Banking Department	XacBank
Nomin Gereltbaatar	Project Development Officer, Eco Banking Department	XacBank
Enkh-Erdene Erdenekhuyag	Senior Project Development Officer, Eco Banking Department	XacBank
Tuul Galzagd	Director, Eco Banking	XacBank
Tsevegjav Gumenjav	CEO	XacBank
Randolph Koppa	Chair, Representative Governing Board	HMB
Nyamsuren Davaatseren	Head of Green Funding Office, Foreign Fund Management and Monitoring Unit, International Banking Department	HMB
Erdenebayar J.	Head of Business Development	MMS Green Building
Batsaikhan B.	Business Development Specialist	MMS Green Building
Tsolmon Namkhainyam	Modern Energy Technologies Lead	USAID Mongolia Energy Governance Activity Programme, Abt Associates
Bold Magvan	CEO	MGFC
Davaa-Ochir Altanzul	Project & Partnership Manager	Mongolian Sustainable Finance Association
Byambadorj Bilegsaikhan	Business Development & Partnership Manager	Mongolian Sustainable Finance Association
Khishigjargal Kharkhuu	Programme Analyst, Climate Change UNDP Mongolia Country Office	United Nations Development Programme
Bathargal Zamba	Special Envoy of Climate Change of Mongolia	Government of Mongolia
Tsendenjav Zandabazar	Director of Energy Efficiency & Conservation Department	Mongolia Energy Regulatory Commission
Batbold Erdenebat	Director General of Development Policy, Land Management, and Urban Planning Department	Ministry of Construction & Urban Development
Ariunbold Sukhbaatar	Policy and Planning Department Senior Expert	Ministry of Energy
Otgontsetseg Luvsandash	Secretariat of JCM	Ministry of Environment & Tourism
Arnaud Heckmann	Portfolio Management Unit Head, Nepal (former Head of Portfolio Management in Mongolia)	ADB
Shannon Cowlin	Energy Expert	ADB
Andreas Fiebelkorn	Analyst (in charge of GCF communications)	EBRD
Takacs Hannes	Head of Mongolia Country Representation	EBRD

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

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4. NORTH MACEDONIA COUNTRY CASE STUDY REPORT

CONTENTS

TABLES

A. BACKGROUND AND CONTEXT

This country case study has been conducted as an input into the Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach, as launched by the Board of the GCF through decision B.34/08. The evaluation is being conducted by the GCF-IEU and Econoler, and is focused on assessing the relevance and effectiveness of the GCF's approach to the energy sector to inform future strategy, policy or guidance. The evaluation will also be used to update the GCF sectoral guidance. The evaluation is informed by multiple data sources and methods, including country case studies.

This country case study report on North Macedonia is based on the results of desk reviews, interviews, and a country mission undertaken on 17 July 2023. The country mission team was represented by Denitsa Ruseva (Econoler). The identified stakeholders and all AEs were reached for interview, either on-site or virtual. Six interviews were held in total during the country mission, all with stakeholders that have some experience with the GCF in the country (see Appendix 4–1).

1. COUNTRY CONTEXT

Table 4–1. Overview of North Macedonia's country context

CATEGORY	COUNTRY
Demographics	The total population of North Macedonia is 2,133,410 (2023 est.) (urban: 59.5 per cent, rural 40.5 per cent). 21.6 per cent (2018 est.) of the population lives in poverty (Central Intelligence Agency, 2023).
GCF group status	Eastern Europe
Governance conditions	As evaluated by the WB's six governance indicators (2021 data), North Macedonia ranks relatively high in Regulatory Quality (66th percentile), average on Rule of Law (52nd percentile), Voice and Accountability (52nd percentile), Political Stability and Action Against Violence/Terrorism (50th percentile), as well as Government Effectiveness (50th percentile), and slightly lower in Control of Corruption (43rd percentile) (Kaufmann and Kraay, 2023). Fragile and conflict-affected State status: N/A (World Bank, 2022). Governance: North Macedonian politics take place under the framework of a parliamentary republic with a civil law system. President Stevo Pendarovski has been Chief of State since May 2019. (Central Intelligence Agency, 2023).
Economic and development conditions	Development status: Upper middle income (World Bank, 2023b). Important economic sectors: The services sector accounts for 62.5 per cent of gross domestic product (GDP) followed by the industry sector at 26.6 per cent and the agriculture sector at 10.9 per cent (Central Intelligence Agency, 2023). Outlook: After a strong recovery in 2021, economic growth slowed down in 2022 due to the disruptive impact of Russia's invasion of Ukraine. Domestic output expanded by 2.1 per cent compared to the previous year, driven mainly by a significant increase in gross investments, attributed largely to import-driven stockpiling. However, despite experiencing double-digit growth, exports fell behind imports. The services sector also contributed to the expansion of the economy. Capital expenditures were cut in a budget revision to create space for crisis-related transfer payments (World Bank, 2023a).
Access to finance	According to the WB's Global Findex database, 85 per cent of adults in North Macedonia had an account at a financial institution in 2021. In North Macedonia, domestic credit to the private sector, which serves as an indicator of the financial system's depth, was 55.74 per cent of GDP in 2022.

CATEGORY	COUNTRY
	While this figure is below the levels seen in developed countries, it is comparable to other countries in the Western Balkan region. Banks dominate the credit market, accounting for 53.35 per cent of GDP in total credit to the private sector. Other financial institutions, such as savings houses, leasing companies and other financial companies, provide only a small portion of credit. Banks are the primary source of credit, and medium and large companies as well as exporters are more likely to borrow from them (Macedonia 2025, 2020; World Bank, 2023c). By the end of 2022, the level of publicly guaranteed and unguaranteed debt decreased to 59.6 per cent of GDP. Inflation played a role in lowering the debt-to-GDP ratio, although nominal public debt remained higher compared to the pre-crisis period (World Bank, 2023a). The WB's Ease of Doing Business Index: North Macedonia ranks high among developing countries at 17 out of 190 countries (World Bank, 2021).

2. ENERGY SECTOR CONTEXT

North Macedonia operates under a regulated electricity market framework, mainly characterized by vertically integrated State-owned power utility companies. Efforts have been made to introduce competition and liberalize the market to attract private investments and enhance efficiency.

North Macedonia has relatively high dependence on electricity imports compared to other countries in the region, with imports making up around 40 per cent of total electricity consumption (Central Intelligence Agency, 2023). The country has a well developed transmission network, including 577km of 440kV lines and 1,601km of 110kV lines managed by the transmission system operator, MEPSO. The 440kV lines form a ring connecting the largest electricity producer, TPP Bitola, with direct consumers and neighbouring countries. North Macedonia also has interconnections with Serbia, Kosovo and Bulgaria, as well as two with Greece.

Despite progress, the energy sector in North Macedonia faces several challenges. One is the relatively high duration and frequency of electricity supply interruptions in the distribution network compared to the region. There is potential for improving power supply reliability in the distribution network, which could be achieved by investing in infrastructure and upgrading the network. Another challenge is the region's dependency on imported energy resources, particularly natural gas and electricity (North Macedonia, 2020).

Being a candidate country to the European Union, North Macedonia aims to harmonize its policies with those of the European Union, including legislation related to energy efficiency (EE) and renewable energy. Several EU directives must be transposed to its regulatory frameworks because the country is part of the Energy Community Treaty. These directives are the Energy Services Directive 2006/32/EC, Energy Efficiency Directive 2012/27/EU, Energy Labelling Directive 2010/30/EU, Energy Performance of Buildings Directive 2010/31/EU and Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

a. Energy matrix

Coal-fired thermal power plants and hydropower plants constitute the primary sources of electricity generation in North Macedonia. In 2020, fossil fuels were responsible for generating 71.4 per cent of electricity, with large and small hydropower plants contributing 24.7 per cent and the remaining 3.9 per cent generated from other renewable sources (Central Intelligence Agency, 2023). Over the past few years, electricity generation from coal has been steadily declining, while the overall capacity of renewable energy sources (RES) has been increasing (North Macedonia, 2020).

In terms of end uses, the majority of North Macedonia's energy consumption is attributed to the residential and commercial sectors that account for around 51 per cent and 22 per cent of total energy consumption respectively. The industrial sector accounts for around 26 per cent of total energy consumption, while transportation and agriculture account for less than 1 per cent combined (North Macedonia, State Statistical Office, 2021).

According to the *National Inventory Greenhouse Gases Report*,[5] the net GHG emissions in 2019 increased by 18.7% compared to 1990, or 48.2% compared to 2016. The energy sector contributed the highest share of emissions at 73.7 per cent, followed by agriculture (excluding forestry and other land-use) at 11.8 per cent, the industrial processes and product use sector at 8.5 per cent, and the waste sector at 6 per cent. However, the country has significant potential for GHG emission reductions due to its heavy reliance on fossil fuels, especially on domestic lignite for electricity production. The grid emission factor of the country is 743gCO_2/kWh, which is higher than the European Union average (353gCO_2/kWh) and the world average (530gCO_2/kWh). Agriculture is a crucial economic sector, contributing almost 11 per cent to GDP and employing around 22 per cent of the population. It is highly vulnerable to climate change impacts including floods, droughts, forest fires and extreme temperatures, all of which are exacerbated by climate change.

North Macedonia sees its European Union accession process as a chance to implement significant structural reforms, including fiscal consolidation and tackling informality; governance reforms; integrating the economy with the rest of the European Union; attracting more foreign direct investments to accelerate growth; and addressing the relatively low productivity of the private sector. The country has fully aligned its energy policy and legislation with the European Union Energy Community's priorities by emphasizing EE and RES. The country has implemented various policies and measures to reduce GHG emissions and mitigate climate change, primarily focusing on the energy supply, buildings and transport sectors (see Table 4–2 below). Some key initiatives include efforts to reduce distribution losses in the energy supply system, develop and utilize RES power plants, adopt district heating systems in Bitola, implement appliance labelling and public awareness campaigns thereof, refurbish and construct buildings in line with energy performance standards and regulations, promote the increased use of railways for transportation purposes, replace and renew the vehicle fleet, and encourage alternative modes of transportation.

b. Sustainable development in the energy sector and related policies

Table 4–2. Sustainable energy policies and strategies

STRATEGY	STATUS	BRIEF DESCRIPTION
National energy policies	Enacted February 2020 – Energy Efficiency Law December 2019 – Strategy for Energy Development July 2020 – National Energy and Climate Plan	The Energy Efficiency Law, adopted on 5 February 2020, is compliant with European Union legislation and establishes the legal framework for EE policies, outlines Ministry of Energy and Energy Agency responsibilities for implementing the law, and defines obligations for public sector entities. It also promotes energy services and EE in buildings and sets requirements for energy-related product labelling and eco-design. One of the primary objectives of the Energy Efficiency Law is to align with UN Sustainable Development Goals and enhance EE in the housing and construction sector by improving building energy performance. The Energy Efficiency Law provides the overall legal framework for the implementation of the Strategy for Energy Development in North Macedonia until 2040 while

[5] See https://unfccc.int/sites/default/files/resource/IV%20Inventory%20report.pdf.

STRATEGY	STATUS	BRIEF DESCRIPTION
		prescribing the adoption of a large set of bylaws that will enable its full transposition into national legislation. According to the Energy Efficiency Law, the country's overall EE policy is determined in the Strategy for Energy Development in North Macedonia until 2040, adopted in December 2019. It presents three scenarios – reference, moderate transition and green – which reflect different dynamics of the energy transition and enable flexibility in North Macedonia's response to relevant European Union policies and governance for a modern, competitive and carbon-neutral economy by 2050. North Macedonia was the first Energy Community Contracting Party to develop and submit its draft National Energy and Climate Plan for formal review, in July 2020. It covers the period from 2021 to 2030. The plan comprehensively addresses all five dimensions required by the Energy Union, including decarbonization; EE; energy supply security; the internal energy market; and research, innovation and competitiveness. Other documents that have been implemented with climate aspects are the Energy Law, the Law on Environment, the Climate Action Law, energy rulebooks and bylaws, the National Energy Efficiency Action Plan, bylaws on RES and the Strategy for Renewable Energy of North Macedonia by 2020.[6]
ENDC	Submitted in 2021	North Macedonia submitted its first NDC in 2015 and an updated version in 2021, prepared by the Ministry of Environment and Physical Planning. The ENDC increases the country's intended GHG emission reductions to 51 per cent by 2030 compared to 1990 levels (82 per cent in net emissions). The ENDC is focused on mitigation, with a vision to include an adaptation component in subsequent submissions once the relevant national strategic and planning documents are prepared and adopted. The main components of the ENDC cover the following areas: mitigation ambition, implementation and communication. The ENDC consists of 63 mitigation measures in total, including those in the following sectors: energy (32 measures); agriculture, forestry and other land-use (11 measures); and waste management (4 measures). The remaining 16 measures aim to facilitate the implementation of mitigation measures, such as carrying out pilot projects or adopting new programmes (North Macedonia, Ministry of Environment and Physical Planning, 2021a). The mitigation actions identified for the energy sector are split between the following subsectors: electricity generation and transmission, EE and transport. The overall GHG emission reductions expected to be achieved via the above mitigation actions in the energy sector are 3,205 $GgCO_2e$ in 2030 compared to 1990.
NAP	Under development	The Republic of North Macedonia aims to develop a NAP based on nexus approaches covering various sectors such as water, food, energy, health, biodiversity, tourism, forestry and infrastructure. The plan will integrate cross-sectoral and sector-specific adaptation actions prioritizing investments based on national and sectoral policies, extensive consultations with stakeholders and alignment with the Disaster Risk Reduction Strategy (North Macedonia, Ministry of Environment and Physical Planning, 2021a).

[6] Links to many of these documents are available at https://klimatskipromeni.mk/article/248.

STRATEGY	STATUS	BRIEF DESCRIPTION
		The NAP Global Support Programme has supported the country by preparing a road map, producing a stocktaking report and identifying key entry points, as well as building capacity and facilitating access to additional climate finance (Global Support Programme, n.d.).
Long-term strategy	Adopted September, 2021	North Macedonia's main goal is to reduce national net GHG emissions by 72 per cent (or 42 per cent when excluding emissions from forestry and other land-use, aviation, and electricity imports) by 2050 compared to 1990 levels, while increasing resilience to climate change impacts. The key elements of North Macedonia's long-term strategy are as follows. • Mitigation (more than 62 measures): The energy sector in North Macedonia will play a crucial role in achieving significant emission reductions by 2050 compared to 1990 levels by reducing GHG emissions by 64 per cent in the sector. This will be accomplished through the implementation of carbon taxation and the increased use of RES such as wind and solar. Transitioning away from carbon-intensive national lignite as an energy source is essential. Additionally, the transport sector aims to reduce GHG emissions, mainly by increasing the adoption of hybrid and electric vehicles and reducing fuel consumption in traditional vehicles. Agriculture will contribute to reduce emissions by 34 per cent in the sector through sustainable practices, including increased carbon sequestration in the soil and the use of new technologies. The forest sector will also play a crucial role by providing a carbon-neutral energy source through afforestation and sustainable forest management. The objective is to increase carbon sinks by 1,733 per cent in the sector. However, the waste sector requires greater efforts to implement existing measures aligned with European Union standards to achieve a 2 per cent emission reduction in the sector. • Adaptation: Data collection is essential to respond appropriately and promptly to irrigation water use issues. For effective adaptation in agriculture, a national research plan for biodiversity and an indicator system to monitor climate change impacts on biodiversity are necessary. The adoption of a NAP is crucial for North Macedonia to identify and address adaptation needs, protect vulnerable communities, and enhance adaptive capacity in various sectors and ecosystems. • Cross-cutting issues: For effective climate action implementation, a comprehensive legal basis and coordination instruments are essential, along with mechanisms to monitor policy implementation. Integrating climate aspects into strategic planning documents such as the National Strategy for Education and the National Innovation Strategy will foster climate awareness and capacity-building in education and research. The successful transition to a low-carbon economy relies on technological innovation and behavioural changes and requires new skills and awareness. Sustainable implementation, monitoring and reporting of mitigation policies are crucial for managing the overall climate change framework (North Macedonia, Ministry of Environment and Physical Planning, 2021b).

c. Institutional roles and responsibilities in the energy sector

The Ministry of Economy oversees energy policies and regulations, while the Energy Agency is responsible for implementing the policies and promoting renewable energy and EE in North Macedonia.

According to the Law on Climate Action, the Ministry of Environment and Physical Planning (MoEPP) is the primary coordinating body for climate-related initiatives. MoEPP is tasked with establishing both the national inventory system and the system for reporting on the country's policies, measures and projections. Additionally, MoEPP assumes overall responsibility for coordinating activities related to the NDC.

The Energy and Water Services Regulatory Commission of North Macedonia is responsible for regulating and overseeing the energy and water sectors, ensuring compliance with laws and regulations. It sets fair tariffs for electricity, natural gas and water services, while monitoring markets to promote competition and protect consumer interests. The Commission grants licences and permits to companies meeting standards, prioritizes consumer protection, promotes EE and renewable energy, mediates disputes, develops regulatory policies, fosters market liberalization, and monitors industry performance and trends.

The largest domestic electricity producer is Elektrani na Severna Makedonija (State-owned and commonly known as ESM),[7] with 90 per cent share of all domestic electricity production, followed by CCPP TE-TO (private), EVN Elektrani (private) and other smaller producers.[8] MEPSO operates the power transmission system, transmitting high-voltage electricity between major producers and adjacent systems for imports/exports, delivering it to transformer stations where it is lowered to medium voltage. Elektrodistribucija, as the distribution system operator, takes over from the transmission system and distributes electricity to final consumers through a countrywide network.

The MEMO National Electricity Market Operator is responsible for organizing and ensuring efficient functioning, as well as developing markets with bilateral agreements and balanced energy. It also manages activities related to the organized electricity market in the country (North Macedonia, Energy, Water Services and Municipal Waste Management Services Regulatory Commission, n.d.).

3. GCF ENERGY SECTOR PORTFOLIO

In 2022, North Macedonia developed a draft GCF CP.[9] Over 300 stakeholders from more than 70 institutions took part in the CP development process. The CP combines nationally established priorities for GCF support, building upon current policies and frameworks such as the Strategy for Energy Development up to 2040, the National Energy and Climate Plan and the Long-Term Strategy on Climate Action. These documents served as an entry point for the preparation of the ENDC, resulting in alignment between the CP and ENDC.

The CP highlights North Macedonia's climate profile and climate change response. The document also describes the process of identifying country priorities and capacity needs for the GCF as well as the country portfolio. The process of identifying priority projects and programmes considers all North Macedonia's strategic documents, including ENDC commitments.

The CP identifies nine priority sectors – namely, energy, transport, water resources, agriculture, waste, biodiversity, health, forestry and cultural heritage – which are the basis of CP development

[7] Further details on ESM are available at https://www.esm.com.mk/?lang=en.
[8] Further details on CCPP TE-TO and EVN Elektrani are available at https://te-to.com.mk/ and https://elektrani.mk/Home.aspx.
[9] The draft CP was developed in July 2022. The NDA is still waiting for GCF feedback on this draft version.

and targeted through adaptation and mitigation measures. The energy industry is expected to achieve significant emission reductions by implementing the "polluter pays" principle through carbon taxation and by increasing the use of RES in the energy mix. However, this transformation is challenging due to the heavy reliance on carbon-intensive lignite as an energy source. EE is a central focus of climate and energy policies, offering cost savings for businesses and households, improving thermal comfort, and incentivizing participation in emission reduction efforts. In the transport sector, reducing GHG emissions will primarily involve improving EE and renewing the vehicle fleet.

The CP identifies five priority topics for FPs, two of which are related to the energy sector:

- Sustainable energy in the public sector, which corresponds to some activities in current FPs (see the "Projects in the energy sector" description below).
- Increasing the domestic generation capacity from RES. Currently, there is no FP related to this topic implemented in North Macedonia.

The ENDC is focused on GHG emission reductions in the energy; agriculture, forestry and land-use; and waste sectors that are targeted only through mitigation measures. While adaptation measures will be included in the NAP and other strategic documents, the ENDC will reflect those documents as well.

Since the submission of the draft CP, numerous policies have been adopted, including the ENDC, as well as the Law on Climate Action that will be adopted in 2023. A screening process under European Union Chapter 27 has also been launched, necessitating an update of the CP.

NDA. The NDA in North Macedonia is the Cabinet of the Deputy President of the Government of North Macedonia, in charge of economic affairs and coordination with economic sectors.

Nominated AEs. In addition to international AEs and regional DAEs, North Macedonia has nominated the Fund of Innovation and Technology Development as a national direct access entity. The Fund supports innovation activities in MSMEs to achieve technological development. The entity was nominated in April 2022 to initiate the accreditation process for the GCF, but it is still under the process of accreditation.

Table 4–3. AEs with approved FPs

NAME OF AE	ACCREDITATION LEVEL
EBRD	International
WB	International
AFD	International

Readiness and project preparation. North Macedonia has received two RPSP grants, approved for a total amount of USD 943,891, of which USD 937,822 has been disbursed. However, the grants are not energy sector-specific.

The only element mentioned during the interviews that related to the energy sector was an assessment of the energy sector, which was conducted as part of the activities under the process for CP development. It was conducted by Eco Ltd. Group in 2020 within the framework of a technical support project to the NDA. The objectives of the analysis were to identify potential climate finance sources to complement GCF funding for climate change mitigation and adaptation projects; create a list of agriculture and energy adaptation projects for assessment, estimating the required climate financing for each project; and design a prioritization tool based on specific criteria and procedures.

Additionally, a sectoral priority report for the energy sector was prepared, based on the results of the readiness activities and was used to prepare an integrated sectoral analysis report that subsequently supported the development of the CP. Project ideas identified during the readiness activities were considered in the preparation of the CP. Additionally, the NDA confirmed during the interview that the tool for prioritization of projects was used in the CP creation process.

Both readiness activities (described in Appendix 4–2) were implemented by the Food and Agriculture Organization of the United Nations (FAO). Additionally, another RPSP activity, which is to be implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) as AE, has been approved for the estimated cost of USD 916,314 but is yet to start. That programme also does not specifically target the energy sector.

Projects in the energy sector. North Macedonia was relatively early in working with the GCF. Five energy programmes have been approved, all of which are multi-country projects. However, the government did not proceed with the committed funding for two of those projects, as they were not fully adapted to the local context and had unfavourable financing conditions with high interest rates (FP151 and FP152). The Government of North Macedonia must very carefully select projects with concessional funding because this type of funding must be reflected in the country's debt and there is a limit that cannot be exceeded.

Consequently, a no-objection letter was issued for three projects only. There was some progress under one of the projects (FP086), more specifically with the implementation and adoption of the Green City Action Plan (GCAP) for Skopje, as well as a number of policy activities that were held to help Skopje improve its EE. The assigned budget for North Macedonia under these multi-country projects is not included in the available project documentation, and the NDA also does not have this information.

As part of the knowledge-sharing mechanism between the GCF and North Macedonia, a dedicated website presents the relationship between the two and their climate change related activities.[10] It is possible to submit project ideas to the NDA through the website. This website was created under the umbrella of the RPSP (1801-15025). This web page is not updated and maintained regularly as it does not include the latest developments of GCF activities in North Macedonia related to the energy sector. For instance, FP194 is not mentioned.

FP086 "Green Cities Facility" is a multi-country project executed by the EBRD. The EBRD is addressing the climate change challenges faced by cities in its operational countries through the establishment of a Green Cities Facility. The Facility was signed and became effective in 2019, with four key components:

- GCAPs and Policy Dialogue: GCAPs serve as strategic guides for municipalities in their sustainable urban planning efforts. They outline a city's vision, objectives, actions and priority investment projects to address environmental issues. GCAPs also inform policy development for climate and environmental goals.
- Green City Infrastructure Investments: The Facility supports climate-focused infrastructure projects in beneficiary cities, targeting the priority climate challenges identified in GCAPs. These projects are aimed at reducing GHG emissions, enhancing climate resilience and improving urban services. These investments are expected to be cost-efficient and may include cost-recovery measures.
- Technical Support and Knowledge Building: Recognizing the importance of TA and capacity-building, the Facility provides support for project preparation, implementation and monitoring. This component ensures the effective selection and deployment of climate-friendly

[10] See http://www.greendevelopment.mk/.

technologies, builds local capacity for project operation and maintenance, and sustains the climate benefits of investments over time.

- Green Capital Market Road Maps: The Facility collaborates with various stakeholders to develop tools and skills required by cities to attract private sector finance for green investments, particularly in local capital markets. This involves working with national ministries to establish frameworks for green investments and assisting selected cities in developing green capital markets. The aim is to promote awareness about green finance, define key information sources, align with green standards and facilitate the issuance of green bonds to fund eligible investments. At least eight cities will be supported in this endeavour, based on their readiness and potential creditworthiness.

It was mentioned during interviews that the City of Skopje has developed its GCAP under this project (financed by donor co-financing), and remote capacity-building was also held under the GCAP. Additionally, Skopje identified three subprojects that were signed in the water and transport sectors:

- GrCF Skopje Bus projects
- GrCF2 W2 Skopje Wastewater Project
- GrCF2 W2 Skopje Bus Rapid Transit Project

Under FP086, other policy activities that helped Skopje to improve its EE were developed: the preparation of a Regulation on Energy Audits in Buildings and support for Article 7 (Energy Efficiency Directive) compliance and the development of an Energy Efficiency Obligation Scheme.[11]

The EBRD submitted a restructuring proposal to the GCF on 18 July 2022 due to multiple global crises – namely, the COVID-19 pandemic and its continuing impacts on cities; the war in Ukraine; the energy crisis; the accompanying rise in prices, interest rates and fiscal burdens; and extreme climate events – that resulted in high uncertainty and reduced economic activity. These events significantly slowed down the implementation of the project. The EBRD recognized the necessity of adjusting various parameters of the project to align with the evolving needs of beneficiary cities for efficient and effective impact delivery, as follows:

- Increase grants for adaptation-related infrastructure investments
- Adjust pricing to ease the financial burden on beneficiary cities, including aligning interest rates for high- and low-concessionality countries and removing commitment and service fees
- Expand the geographical scope to include new host countries
- Broaden the Facility's eligibility criteria to align with the EBRD Green Cities Framework, including population thresholds, expanded sectors for climate mitigation and increased impact thresholds
- Increase GCF financing availability for infrastructure investments in USD
- Reallocation of GCF non-reimbursable funds from Components 1 and 4 to Component 3

The NDA of North Macedonia has been engaged in the suggested amendments. The EBRD held follow-up meetings and shared briefing notes with detailed information after submission, as requested by NDAs including North Macedonia's NDA. In the project's most recent APR of 2022, EBRD mentioned that a two-year extension will be requested in the next reporting period to facilitate the full implementation of the proposed changes and support the successful deployment of the Green Cities Facility.

[11] As reported in the APRs of FP086.

FP177 "Cooling Facility" is a multi-country project aimed at providing access to cooling while minimizing negative climate impacts. It has been effective since 2022 and is implemented by the WB. The Cooling Facility consists of three main components that support activities to be adapted to the needs and specific context of each country that is part of the Facility:

- Policy, regulatory and enabling environment support: This component, funded with a GCF grant of USD 15.7 million, is focused on strengthening institutional, policy and regulatory frameworks. It supports programme design, capacity-building and awareness-raising activities. It aims to create an enabling environment for sustainable cooling investments aligned with the Kigali Amendment. Activities include stakeholder capacity-building, TA for plans and regulations, market mechanism design, and communication campaigns.
- Financing for cooling investments: With USD 141.3 million in GCF funds (including loans and grants), this component promotes the adoption of climate-friendly cooling technologies and systems. It is aimed at expanding access to and deployment of sustainable cooling solutions, particularly in underserved markets. Concessional funds are provided to support climate-friendly cooling investments and offer credit lines to financial intermediaries.
- Project management: This component, not funded by the GCF, is focused on the management, coordination and implementation of project activities by the executing entities and project implementing entities. It ensures compliance with contractual obligations established with AEs.

Funding for North Macedonia will be channelled through the EE Fund, which is under implementation as of the date of this report, and there are no implemented subprojects in North Macedonia. There is a dedicated project implementation unit within the Ministry of Finance, responsible for the management and execution of the project. The timeline of the activities in North Macedonia has been extended a couple of times – for instance, another extension was recently requested up to February 2024.

FP194 "Programme for Energy Efficiency in Buildings (PEEB) Cool" is a multi-country project implemented by the AFD in collaboration with GIZ and Proparco. The proposed intervention has two components – an Investment Facility and an Enabling Facility:

- Component 1 – Investment Facility: This component, with a budget of EUR 987.8 million and USD 326 million, provides financing and TA to public and private subproject owners. The key beneficiaries include subproject owners, architects, construction companies and financial intermediaries. Its aims are the following:
  - Output 1.1: This output assists project owners at various investment phases. It includes TA during the identification and design phases to identify climate impacts as well as adaptation and mitigation measures. TA continues during the construction and operation phases to ensure the effective implementation of agreed upon adaptation and mitigation measures. Capacity reinforcement for project owners, financial intermediaries and contractors is offered, including training in construction methods adapted to local climates and materials.
  - Output 1.2: Focused on signing financing agreements for investments, recognizing that bioclimatic and energy-efficient building design typically incurs about 10 per cent higher investment costs compared to the baseline.
- Component 2 – Enabling Facility: With a budget of EUR 21.5 million, this component is focused on creating an enabling environment for green building investments. It includes four output areas:

- Output 2.1: Supports further investments in green buildings by enabling sectoral road maps and action plans in targeted sectors, contributing to economic recovery and green job creation.
- Output 2.2: Prepares the ground for building sector transformation by developing policies that incentivize and support green buildings. It incorporates insights from financing construction projects into policy development as well as improving public policies, national incentives and procurement criteria.
- Output 2.3: Enables private and public sector actors to work towards building sector transformation through capacity development. This supports long-term climate impacts beyond direct financing effects.
- Output 2.4: Utilizes programme experience to accelerate the global building sector's transformation by sharing knowledge regionally and internationally. This covers knowledge transfer and dissemination across the entire programme, including components 1 and 2.

Although it was adopted in 2022 in North Macedonia, the project will start in October 2023. A meeting was held in April 2023 between the AE and NDA. During the interviews it was mentioned that the AE has initiated administrative measures to assess their requirements for advancing their TA initiatives. The AE has also inquired about obtaining information regarding the national debt to ensure it remains within acceptable limits.

Table 4–4. Funded activity portfolio in the energy sector

Project number	Name	Public/ private	Sectoral guide				AE	Approval date/status	GCF energy investments (USDm)	Total GCF budget (USDm)
			Energy generation and access	Energy efficiency	Cities, buildings, and urban systems	Low emission transport				
FP086	Green Cities Facility	Public			X	X	EBRD	20/10/2018	3	93.15
FP177	Cooling Facility	Public		X	X		WB	7/10/2021	120.9	157
FP194	Programme for EE in Buildings (PEEB) Cool	Public		X			AFD	20/10/2022	232.4	232.4

Source: IEU DataLab.
Note: The budget for North Macedonia activities is limited for all the FPs presented in this table because all FPs are regional projects with at least nine countries in each FP.

4. Limitations

Some limitations were encountered in preparing this country case study, mainly because the energy sector FPs are regional and in the early development stage, with only a few activities in North Macedonia. Most of the available documentation for GCF energy-related projects in North Macedonia provides scant information about the country's progress. For FP086 (for 2020), only one activity has been developed in North Macedonia – namely, the GCAP for Skopje – but this has been donor co-financed. While the data scarcity was known before performing this case study analysis, the purpose was nonetheless to explore the North Macedonia context and projects, identifying the key bottlenecks and bringing the regional perspective to the evaluation.

B. Key findings

The North Macedonia case study offers several important lessons for the GCF. First, there is a need to improve stakeholder awareness within the energy sector, as those knowledgeable about the GCF are often not directly involved in this sector. Readiness programmes should specifically address energy sector needs to ensure a better understanding of the GCF's approach. Second, activities in multi-country GCF projects may not align with the objectives outlined in the FP because they are tailored to individual country needs, which may diverge from the broader FP aims. This misalignment could lead to reduced project impact and hinder the intended paradigm shift. Lastly, transparency and information-sharing issues should be addressed, allowing government access to project progress data and budget allocation details in multi-country projects.

1. Alignment with GCF mandate and North Macedonia's energy sector needs

The GCF's approach and support to energy sector development in North Macedonia is considered by all interviewed local stakeholders to be relevant to the country's priorities. Although GCF investments are made only through regional projects, specific activities adapted to the North Macedonian context are defined in each one. The main support is in EE, which is fully aligned with North Macedonia's commitments under its ENDC. FP177, the Cooling Facility co-financed by the GCF, is a good example.

GCF energy projects in North Macedonia are aligned with the efforts of significant donors to the sector, including EBRD, EIB, KfW and the European Commission. Taking into account only country (not regional) energy projects in recent years, donors aligned with GCF sectoral guidance on energy invested more than EUR 100 million, led by EBRD with more than EUR 30 million. The majority of donor funds tackle EE in the residential and public sectors and in electricity transmission and distribution.

The FP177 Cooling Facility FP states the following: "North Macedonia is seeking to tackle space cooling in the public sector – and lower its energy consumption and associated GHG emissions – through the establishment of an EE fund, a sustainable financing mechanism that is well suited for its circumstances and targeted sectors."

The FP177 activities in North Macedonia are mainly related to the development of an EE fund. The terms of reference for development of the EE Fund did not mention cooling technologies or systems as a focus (North Macedonia,2021). The EE Fund is designed to finance EE measures including reducing electricity and heat energy by 15 per cent in all public institutions (North Macedonia, Ministry of Economy, 2023). The scope of the EE Fund is not specifically linked to cooling, so the

GCF is funding an activity that is not fully aligned with the expected outcomes. This example shows that activities implemented in the country in multi-country projects are not necessarily fully aligned with FP objectives, because activities are tailored to country needs.

2. Contribution to climate goal achievements in North Macedonia through GCF energy sector projects

The country's approach to prioritizing national projects and programmes, provided as part of the CP (still in draft version), considers the NDC commitments; thus, implemented projects should comply with the NDC.

a. Likelihood of achievement of GCF energy sector projects

The energy sector projects in North Macedonia are multi-country initiatives, with only one project (FP086) showing some progress. The project was approved in 2018, so four APRs should have been completed. The APR for 2019 is not available. GCF energy projects are running, and there is no evidence that the outputs planned will not be achieved.

The FP086 activities in North Macedonia include the development of a pipeline of investments that will materialize in the future for the City of Skopje. Furthermore, several policy activities that help cities improve their EE were also undertaken in North Macedonia. Based on the 2022 APR, some infrastructures projects were identified for Skopje public institutions. Until now, no green city infrastructure investments have been demonstrated in North Macedonia (three projects have been financed in other countries).

Energy access and power generation are under the scope of activities. However, energy generation is typically beyond the scope of Skopje Municipality and AE works on large-scale generation projects on grids located far from cities. The AE does not consider EE as an energy project but as improving the competitiveness of the business sector. A project for solar district heating has been suggested in Skopje, which had not been approved at the time interviews were conducted.

Nonetheless, the project is showing delays due to multiple global crises, including the war in Ukraine, rising prices and interest rates.

Nevertheless, transparency regarding the progress made is lacking. The government (NDA) does not receive regular updates on project advancements, and it lacks fundamental information about both the overall project and its subprojects.

b. Changes in the practices of AEs and other stakeholders in North Macedonia, triggered by GCF energy sector projects

Regarding the change in AE practices, the impact of the GCF is limited because all AEs active in the energy sector in North Macedonia are international, with high capacities in and knowledge of the energy sector.

For example, FP194 is a follow-up programme of the PEEB[12] that was launched in 2018. The PEEB was initiated by the governments of France and Germany at COP 22. It combines the expertise of its implementing agencies – namely, the AFD, GIZ and Agence de la Transition Écologique.

The GCF support through readiness has contributed to enhancing the capacity of the NDA on climate change investments and through readiness implementation the NDA has become more familiarized with the operational modalities of the GCF.

[12] Further information about PEEB is available at https://www.peeb.build/about-peeb.

c. Co-benefits of GCF energy sector projects in North Macedonia

The RPSP grants, even though not specifically related to the energy sector, have contributed to accomplish the following:

- Developing the structure and procedures for an effective and operational country coordination mechanism for the GCF that could be used as a basis for climate-related actions in the country
- Carrying out capacity-building efforts
- Emphasizing gender equity
- Building the base for private sector engagement

These outcomes are used to support the origination and implementation of current energy projects.

The co-benefits of implemented projects are not yet being reported. Based on the FPs, the potential co-benefits of the three energy projects are as follows:

- FP086 Green Cities Facility:
  - Social, economic and environmental co-benefits of green city infrastructure, including reducing the public budget to run public services, improving air quality through reductions in toxic emissions, and reducing water and soil pollution
  - Access to municipal services and green jobs for women
  - Improved quality of life for the citizens of Skopje
- FP177 Cooling Facility:
  - Health co-benefits related to space cooling, especially during heat waves
  - Gender benefits by increasing women's representation in engineering professions
- FP194 PEEB Cool:
  - Increased comfort in buildings, 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, thus reducing indoor air pollution and high indoor temperatures
  - Economic benefits linked to the reduction of utilities bills, including water

d. Unintended positive or negative results of GCF investments in North Macedonia

Based on the results of interviews and a literature review, there is currently no adverse impact on the environment observed as a result of GCF investments in North Macedonia. Also, it was not possible to identify any unintended positive results so far, mainly due to the early stages of energy sector projects.

At this stage, there are no unintended negative or positive effects that have been identified or documented.

3. Suitability and effectiveness of GCF Secretariat support in the approval and implementation process of energy sector projects

a. The GCF approach to project origination and its alignment with energy sector needs in North Macedonia

i. Alignment

NDA feedback suggests that the GCF CP and projects are well aligned with the country's priorities and community needs and objectives. Interviewees mentioned that GCF funds offer opportunities for leveraging larger interventions, playing a crucial role in achieving climate targets, especially in preparation for entering a competitive market such as the European Union.

ii. Project origination process

Some interviewees find that the origination process for multi-country projects can be cumbersome and that activities in the FPs may not be highly relevant to the country energy context. This may arise from the inflexible scope of energy activities in multi-country FPs.

The GCF's slow project review and approval processes (up to two years) can lead some potential beneficiaries to seek other sources of funding if they feel their needs are urgent.

b. The GCF's work with relevant energy sector stakeholders, including the network of AEs and executing entities

The GCF works with active international and bilateral institutions that are already engaged in North Macedonia and the Balkans region, notably EBRD and the WB. This should lead to the right partners to implement meaningful projects in the country. For instance, in FP086, the main local counterpart is the municipality of Skopje, representing a third of the North Macedonian population. The Government of North Macedonia is ready to work with most AEs whose projects cover the country's priority sectors.

Feedback from interviewees, while positive overall, does suggest that the involvement of important national energy sector stakeholders (e.g. the division in charge of the energy sector within the Ministry of Economy) seems to be low. This is in spite of an established coordination mechanism that engages key stakeholders who possess comprehensive knowledge of all accessible funding opportunities within the government structure.

It was also mentioned that the country's network of climate-related stakeholders is small and well organized, and that information circulates smoothly. However, it was observed that participants in some of the workshops held to date were not fully aware that the training is financed by the GCF.

c. Assessment of the GCF Secretariat's capacity to support energy sector projects throughout their life cycle

The majority of interviewees expressed a positive view of the GCF Secretariat, describing it as highly collaborative, approachable and responsive. If a project is under development, GCF regional advisors quickly provide clarification on guidelines.

Nonetheless, concerns were raised around the GCF Secretariat having insufficient staff (e.g. one person responsible for handling matters in multiple countries), leading to delays. Significant delays were particularly noticeable in the review of the CP, in resolving technical issues related to the application of the Fund of Innovation and Technology Development, in all RPSP grant approvals, and in the time frames between the issue of a no-objection letter and project launch. Stakeholders do, however, understand the global communication demands faced by the GCF Secretariat.

d. The GCF sectoral guidance in the energy sector

Local energy sector interviewees had limited experience with the GCF, limited knowledge of its energy approach and no awareness of GCF sectoral guides. The NDA is not directly involved in the energy sector in North Macedonia or in GCF energy sector projects, and so does not have extensive knowledge of the GCF energy approach.

e. Comparison of the GCF's energy sector investment cost-effectiveness with those of the private sector and/or other public finance institutions/development agencies

It should be noted that the contribution of the GCF in the country is limited compared to other donors in the climate sector. In the ENDC, for 2018–2019, the GCF represents only 1 per cent of the overall financial support received. On FP086, the energy budget is USD 3 million, less than 5 per cent of the overall budget of projects, and this budget is spread across nine countries. Until now, no specific investment or action in the energy field has been made in North Macedonia under this FP. The energy budget of the GCF represents less than 20 per cent of the total energy budget for both FP194 and for FP177. The WB and the AFD will contribute more than 80 per cent of the investment.

All energy sector projects in this country are multi-country projects, and no specific budget for North Macedonia is stated in their FPs.

For these reasons, it is not possible to identify a finding related to GCF investment cost-effectiveness compared to other finance institutions active in the country.

4. Sustainability of the results and approaches of GCF interventions in the context of the global and North Macedonian energy sectors

a. The GCF's approach to ensuring sustainability and socioeconomic co-benefits of energy sector investments

Since energy sector projects are not fully implemented in North Macedonia, the sustainability approach of energy sector investments is evaluated based on the FPs. In energy projects, investment sustainability is linked to several aspects:

- Good operation and maintenance of equipment and systems
- Market penetration of energy solutions through the availability of technologies, awareness-raising and showcasing best practices
- Strong policy, regulatory and institutional frameworks
- Adapted financing mechanisms

The analysis of FPs generally reveals that the strategies to ensure the sustainability of energy investments are sound.

Moreover, the GCF's emphasis on gender and environmental and social safeguards has prompted AEs to include assessments and considerations in project proposals that are supposed to lead to more sustainable and socially inclusive outcomes.

b. Sustainability of the outcomes of GCF interventions in the energy sector

Since there is little progress in energy sector investments, it is difficult to assess sustainability outcomes based on project implementation.

The GCF's approach to readiness has been aimed at strengthening the institutional framework and coordination mechanisms, which may contribute to the sustainability of future projects. Moreover, the support that will be provided through the EE Fund with GCF funding (FP177) is expected to enhance the country's capacity to implement EE projects and drive long-term sustainability in the sector.

Additionally, the focus on private sector engagement and innovative financing mechanisms can potentially lead to sustainable investments and increased climate finance mobilization (FP177, for example).

5. Coherence between the GCF climate finance delivery with other multilateral entities

Interviewees highlighted several major comparative advantages of the GCF compared to other multilateral funds in the context of the energy sector, as follows:

- Blending of concessional funds to provide opportunities for larger interventions. This becomes particularly crucial when other funding sources are limited, thereby making GCF support essential.
- The GCF's extensive knowledge regarding ongoing activities in various countries. This enables developing nations such as North Macedonia to access valuable practices and customize relevant projects to suit their specific contexts.
- Other funds, such as the Global Environment Facility, have limits in terms of funding by sector. The GCF has just one requirement regarding the assignment of investment: it is mandated to invest 50 per cent of its resources in mitigation and 50 per cent in adaptation in grant equivalent. There are no sectoral investment limitations.
- Readiness projects serve as valuable preparation for project implementation.
- Alignment of projects with country NDCs and flexibility in determining the scope of national full-sized projects.

The level of GCF investment in the energy sector in the three FPs is limited. Energy activities represent only 1 per cent of the FP086 overall budget and 3 per cent of the GCF budget.

For FP177 and FP194, GCF funding is limited to around 20 per cent of the overall budget. However, the GCF is providing its investment in grants that usually are limited resources for AEs. For example, the GCF is providing 85 per cent of the grants for FP194. The AFD has very limited access internally to grants, and that institution is obliged to rely on other institutions, such as the GCF, to provide this type of funding.

There is therefore some evidence of GCF additionality in energy sector projects in North Macedonia.

6. GCF energy sector project approach on gender equality

At this stage of FP implementation, there is no evidence about monitoring and reporting on gender action plans and related co-benefits for North Macedonia. The 2022 APR for FP086 highlights progress on the gender action plan for Serbia and Moldova only, as these countries have made some progress in its implementation. The report outlines plans for the upcoming period, which include initiating GCAPs with gender assessments conducted in a gender-responsive manner, exploring additional technical support for gender activities, and engaging in policy dialogue to promote women's economic opportunities.

Based on interview results, stakeholders stated that it is important for them to actively consider and address gender equality throughout project planning, implementation, monitoring and reporting processes, resulting in more inclusiveness and responsiveness to the needs of all communities. The FPs have gender action plans, and gender action plans are also mentioned in the FPs. The gender action plans of energy projects incorporate relevant outputs. It should be highlighted that gender equality is considered in the GCAP for Skopje (FP086) and tracked in the completion report of the second readiness grant (1810-15529).

Also, during interviews, it was mentioned that gender considerations are set into the national eligibility criteria for project prioritization (provided in the draft CP). All proposals are also obliged to have gender assessments and action plans.

Moreover, under the third readiness grant (2008-16357), guidelines will be developed for vulnerable groups and the NDA on how to mainstream social aspects in climate change projects.

7. Country ownership towards GCF investments in the energy sector

The GCF is developing a CP for North Macedonia, and it is fully aligned with the NDC of the country. Moreover, the GCF is mentioned as one of the available funding sources in one of the supporting documents of the ENDC (*Financing Strategy for the Macedonian Enhanced Nationally Determined Contribution to Climate Change*).

Stakeholders have taken ownership of implementation to some extent, especially during readiness activities. The NDA is positioned within the government, and it can properly identify the country's needs and ensure the effectiveness of implemented activities. However, it was mentioned that the NDA faces obstacles with in-depth project monitoring as there is scarce information on implemented projects in the APRs for specific countries, and AEs do not provide sufficient information. Basic information on project progress, such as the type and amount of money disbursed, and the progress of different subprojects should be submitted to the NDA on a regular basis, which is not the case in North Macedonia. Furthermore, it was mentioned that the approved disbursement amount for projects does not align with the initially requested amount during the no-objection process, and variances are consistently observed. AEs provide a funding amount in the initial financial construction of projects, but it never matches the final amount after negotiations between AEs and the GCF.

All climate-related support negotiations include relevant energy sector stakeholders. However, some interviewees observed that a strategy or clear guidelines from the GCF for developing countries is needed to be able to merge available financing sources.

Also, regular regional events facilitate sharing experiences among countries. North Macedonia stakeholders perceived such regional conferences as necessary and will host one in October 2023. This event is not specifically related to the energy sector; however, it can increase the awareness of stakeholders of the region about climate change actions to some extent in the energy sector.

8. Fostering technical innovation and the deployment of diverse financial instruments in the energy sector by the GCF

One of the key aspects mentioned by interviewees is the GCF's focus on blending financial mechanisms, which allows for co-financing with other climate finance channels and institutions. This blending approach helps attract more funds and investments for energy projects, making it possible to implement larger and more impactful initiatives. It was also noted that further guidelines for countries on blending available sources should be provided by the GCF since engagement requires strong local capacity.

Additionally, through the RPSP grants, the country has been active in engaging the private sector through various initiatives and tools. Well-structured knowledge management and sharing tools have been implemented under the RPSP. It was mentioned that, before the GCF's RPSP grants, nothing had been done to engage the country's private sector in climate issues. Additionally, the private sector is the least aware about GCF opportunities and climate investments in general.

The FP177 Cooling Facility includes the development of the EE Fund of North Macedonia. The Fund is an innovative financing mechanism to finance EE in countries. Since 2014, the EE Fund has been identified as a "viable option for scaling up energy efficiency (EE) financing in the public sector in the Western Balkans" (Limaye, Singh, and Hofer, 2014). An EE fund is "generally capitalized using a range of different sources of financing, such as concessional loans or grant funds from donor agencies, government budget allocations, special tariffs or levies on electricity sales, petroleum taxes, revenue bonds, or other sources."

9. The extent of GCF energy sector investment replicability and scalability with the objective to transform the market

As most of the projects are still in their early development stages, it is too soon to discuss their uptake, potential second phases or policy changes. However, the design of some projects contributes to the scalability and replicability of their objectives. The third RPSP grant (2008-16357) was identified by the GCF as unique, and it has been mentioned that that programme would be replicated in other countries. Additionally, through the RPSP, GIZ may identify subprojects that can be financed and realized through FP194.

C. Emerging lessons for the GCF

The following emerging lessons for the GCF can be drawn from the North Macedonia case study:

- In entering a new country programming jurisdiction, it is critical to engage with experienced international agencies that already have a track record in the energy sector. Doing so can help get projects initiated with the appropriate local entities. It does not, however, necessarily lead to connection with all key stakeholders in the sector, some of whom may remain ill-informed of the GCF and its potential support. Greater direct outreach may sometimes be needed, bearing in mind resource constraints and the degree of potential for future programming in line with the GCF's mandate.
- RPSP grants, specifically aimed at key energy sector stakeholders, may be needed to redress the awareness gap and move more quickly towards project proposals, even if developed through AEs.
- While multi-country projects may be a necessary way to engage new, smaller-scale country partners, care must be taken that regional activities in FPs correspond to particular country needs and priorities, or that activities addressing these are added to the extent feasible. The multi-country projects should be aligned with the aims of the FP as well as the needs of the countries. In the case of FP177, the evidence proves that the alignment is not complete.
- Effort is also needed to ensure that the Government of North Macedonia, specifically the NDA, has sufficient access to information on the progress of multi-country projects. This includes crucial details about project funding, progress and subprojects, thereby enabling the NDA to assess project performance accurately. This situation is accentuated by the fact that in multi-country projects, the budget dedicated to each country is not clearly identified in the FP and is not communicated to the NDA.

APPENDIX 4–1. LIST OF INTERVIEWEES

FULL NAME	FUNCTION	AFFILIATION
Stefan Kostovski	Associate Banker, Energy Europe	EBRD
Igor Slavkoski	International Climate Finance Specialist	FAO
Kristina Mitic	National Team Leader	FAO
Daniel Josifovsky	Advisor	GIZ
Maria Shishovska	European Union Strategy Support	Ministry of Economy
Magdalena Daskalova	Advisor	Ministry of Economy
Dr. Teodora Obradovikj Grncarovska	State Counsellor on Climate Change	MoEPP
Sandra Andovska	Advisor	The Cabinet of the Deputy Prime Minister in Charge of Economic Affairs, Coordination of Economic Sectors and Investments

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

APPENDIX 4–2. RPSP GRANTS

1801-15025 "Support for the management of an effective national coordination mechanism regarding the Green Climate Fund". This project was focused on enhancing the institutional capacities of the NDA to fulfil its roles and responsibilities related to the GCF. It was aimed at facilitating stakeholder engagement processes and initiating the preparation of a GCF Country Work Programme. The project supported the establishment of a national mechanism, institutional framework, and procedures to effectively access and utilize GCF resources. Notably, a no-objection procedure was validated to assess FPs for GCF financing.

1810-15529 "Strengthening country capacities for climate change adaptation and mitigation and finalization of Country Work Programme for the Republic of North Macedonia". This project was aimed at further strengthening the knowledge and capacity of the NDA and relevant country stakeholders to access environmental climate finance from the GCF. The first CP was developed and submitted to the GCF and includes a pipeline of country-led projects addressing climate change adaptation and mitigation actions in priority sectors. This project also contained capacity-building and awareness-raising through training courses and tool development. Under this project, the Fund of Innovation and Technology Development was nominated to be the first national entity to initiate the GCF accreditation process.

2008-16357 "Building capacity towards sustainable and climate-resilient human capital development in North Macedonia". This readiness project is aimed at promoting sustainable human capital development in North Macedonia by building capacities and creating an evidence-based environment in the health, education, labour and social protection sectors. These sectors deal with socially vulnerable and marginalized groups and are often overlooked in climate finance discussions. The project seeks to address existing needs by strengthening the capacity of the NDA and the Strategic Advisory Committee to guide climate finance and project implementation, with a focus on sustainable human capital development. Additionally, it is aimed at enhancing coordination among key ministries, public institutions, civil society, academia and the private sector to integrate climate change aspects in the targeted sectors. A climate change focal point in the three ministries will be established to coordinate activities. The proposal also emphasizes the production of data, knowledge and policy recommendations to incorporate climate change considerations into strategic frameworks for the three sectors. Some identified needs of end users could be addressed through FP194.

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5. TONGA COUNTRY CASE STUDY REPORT

CONTENTS

TABLES

A. BACKGROUND AND CONTEXT

This country case study has been developed as an input for the Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach, conducted by the IEU of the GCF. This country case study report on Tonga is based on the results of a desk review, interviews and a country mission undertaken from 19 to 27 June 2023. The country mission team included Ivan Gerginov (Econoler consultant) and Daisuke Horikoshi (GCF-IEU). The evaluation team conducted interviews with representatives of 15 different organizations (see Appendix 5–1). The team also conducted site visits for project FP090, Tonga Renewable Energy Project under the Pacific Islands Renewable Energy Investment Programme (TREP), as outlined in Table 5–1.

Table 5–1. Site visits conducted during the country mission

PROJECT/LOCATION	SITE	PERSON
FP090 – Nuku'alofa	Battery storage facility	Daisuke Horikoshi
FP090 – Neiafu – Vava'u	Solar system	Daisuke Horikoshi, Ivan Gerginov
FP090 – Vava'u and outer islands	Japan International Cooperation Agency (JICA) installed solar house systems TREP future solar system sites	Daisuke Horikoshi

Source: IEU DataLab

1. COUNTRY CONTEXT

Table 5–2. Overview of Tonga's country context

CATEGORY	COUNTRY
Demographics	Tonga is a Polynesian country comprising 171 islands, 45 of which are inhabited. As of 2021, Tonga had a population of 100,179 (Tonga Statistics Department, 2022), with 74 per cent residing on the main island, Tongatapu, and 14 per cent on Vava'u. The main ethnic group in Tonga is Tongan (97 per cent), followed by part-Tongan (0.8 per cent), other (2.2 per cent), and unspecified (<0.1 per cent) (2016) (Central Intelligence Agency, 2023). The main religions are Protestant (64.1 per cent), the Church of Jesus Christ (18.6 per cent), Roman Catholic (14.2 per cent) and others (Central Intelligence Agency, 2023). 28.4 per cent (2018 est.) of the population lives in poverty.
GCF group status	Asia Pacific, small island developing State
Governance conditions	The WB reports six aggregate governance indicators for over 200 countries and territories, including Tonga (World Bank Group, 2023). The six aggregate indicators are reported in two ways: in their standard units ranging from approximately -2.5 to 2.5, with higher values corresponding to better outcomes, and in percentile rank terms from 0 to 100, with higher values corresponding to better outcomes (out of 215 countries and territories in 2021). According to the WB, Tonga scores on the six governance indicators as follows (the higher the score, the better the performance): • Voice and accountability: 0.57 (ranked 63rd) • Political stability and absence of violence/terrorism: -0.01 (ranked 111th) • Government effectiveness: -0.26 (ranked 131st) • Regulatory quality: -0.29 (ranked 133rd)

CATEGORY	COUNTRY
	• Rule of law: -0.17 (ranked 121st) • Control of corruption: -0.02 (ranked 113th)
Economic and development conditions	Development status: lower-middle income Important economic sectors: • Agriculture: This sector contributes 30 per cent to gross domestic product (GDP) and employs about two thirds of the labour-force (Tonga Statistics Department, 2022). The main crops are squash, coconuts, bananas and vanilla beans, all of which make up two thirds of total exports. Tonga also imports a high proportion of its food, mainly from New Zealand. • Tourism: This sector is a significant source of foreign exchange and employment. Tonga attracts visitors with its natural beauty, cultural heritage and marine activities. In 2019, Tonga received about 62,000 tourists, generating USD 47 million in revenue (Asian Development Bank, n.d.). • Fisheries: This sector is another important export earner and provider of food security. Tonga has abundant marine resources, including tuna, snapper and lobster. In 2019, Tonga exported USD 18 million worth of fish products, mainly to Japan and the United States (Asian Development Bank, n.d.). • Remittances: This sector is a major contributor to Tonga's economy, accounting for nearly one third of GDP. About half of Tonga's population lives abroad, chiefly in Australia, New Zealand and the United States, and they send money back to their families and communities. In 2019, Tonga received USD 131 million in remittances (Asian Development Bank, n.d). Outlook: Tonga's economic outlook for 2022 was challenging due to the impact of the volcanic eruption and tsunami in January 2022, which caused significant damage to infrastructure, housing and agriculture, as well as the ongoing effects of the COVID-19 pandemic and border closures. After a decline in Tonga's real GDP in 2021 and 2022, the International Monetary Fund (IMF) anticipates a strong rebound in FY2023 (July 2022–June 2023), with real GDP growth estimated at 3.0 per cent, supported by the gradual reopening of the borders, the recovery of tourism and remittances, and reconstruction efforts (International Monetary Fund, 2023).
Access to finance	Government access to finance: According to the IMF (International Monetary Fund, Asia and Pacific Dept., 2021), Tonga had USD 216 million in external debt (42 per cent of GDP) as of 2020. Since the volcanic eruption and tsunami in early 2022, which caused substantial infrastructure damage, the public debt of the island has grown. As Tonga is due to start substantial principal payments on its public debt in 2023–2024, the capacity of the Government of Tonga to borrow more to support its energy sector is extremely limited for the foreseeable future. Business access to local finance: Tonga has a relatively high level of financial access compared with some other Pacific Island economies. According to the National Reserve Bank of Tonga, Tonga has 16 commercial bank branches serving a population of about 100,000. However, there are still challenges and opportunities to improve access to finance in Tonga, especially for small and medium-sized enterprises and rural areas (Asian Development Bank, 2019). The International Finance Corporation helped Tonga set up and launch its first credit Bureau in 2019, which now enables banks to share credit information and better manage lending risks, thus lowering their credit defaults and expanding access to finance for individuals and small businesses. Lending and microfinance: According to the Tonga Statistics Department, there were 153 commercial bank loan accounts per 1,000 adults in 2017, down from 159.283 in 2016. Of the main providers of microfinance is SPBD Microfinance Ltd. (Tonga), which is part of the South Pacific Business Development network of microfinance organizations working in Samoa, Tonga, Fiji, the Solomon Islands and Vanuatu.[13] It was launched in 2009 with the mission to eradicate poverty by

[13] For further details on the South Pacific Business Development network, see https://www.spbdmicrofinance.com/.

CATEGORY	COUNTRY
	empowering economically disadvantaged Tongan women with the opportunity to start, grow and maintain sustainable, income-generating microenterprises. SPBD Microfinance Ltd. (Tonga) has disbursed over USD 21 million in loans to more than 8,000 women clients and has a loan repayment rate of over 99 per cent. Capital markets: Tonga is a small and isolated island nation that has a limited and underdeveloped capital market. Tonga does not have a stock exchange or a bond market, and there are no publicly listed companies or government securities in the country. The main sources of financing for businesses and individuals are commercial banks, MFIs, credit unions and informal lenders. Tonga also receives significant foreign aid and remittances from abroad, which help support its balance of payments and public finances.

2. ENERGY SECTOR CONTEXT

Tonga is a small island developing State (SIDS) that faces many challenges in its energy sector, such as high dependence on imported fossil fuels, low EE, limited access to modern energy services, and vulnerability to natural disasters and climate change. The power generation of Tonga is mainly based on imported diesel fuel. However, Tonga is also developing its RES – such as solar, wind and biomass – to reduce its dependence on fossil fuels, with a vision to achieve 100 per cent renewable energy power generation by 2035. The country has taken several steps to increase the share of these RES in its energy mix. The following are some of the recent and ongoing projects and achievements in the power generation of Tonga:

- The launch of the Wind Power Generation System project, which consists of installing three wind turbines with a total capacity of 1.3 MW and an annual generation of 4.5 GWh in Niutoua, Tongatapu.
- The commissioning of the Maama Mai Solar Farm, the largest solar plant in the South Pacific, with a capacity of 6 MW and an annual generation of 9.9 GWh.
- The implementation of the TREP to install solar and battery energy storage systems in Eua, Vava'u and five outer islands, as well as the completion of load shifting and grid stability battery energy storage systems in Tongatapu, which will improve the reliability and efficiency of the electricity grid and enable more integration of variable RES.

In 2023, the energy sector of Tonga is expected to continue its progress towards achieving its 100 per cent renewable energy target by 2035 and also aims to improve EE, reduce energy demand, and enhance energy security and resilience (United Nations Economic and Social Commission for Asia and the Pacific, 2021).

Some of the key challenges of the energy sector in Tonga are as follows:

- The high dependence on imported diesel fuels makes the electricity tariff expensive and vulnerable to price fluctuations.
- The lack of reliable and comprehensive energy data hinders effective energy planning and policymaking.
- The low current penetration of RES limits the potential for reducing GHG emissions and enhancing energy security.
- The government has an extremely limited ability to borrow funds to invest in energy projects and infrastructure due to the very high indebtedness of the island nation (42 per cent of GDP).

a. Energy matrix

Power generation in Tonga is mainly based on imported diesel fuel, which accounted for about 86 per cent of all generation in 2021 (International Renewable Energy Agency, 2023[14]). Since then, there have been numerous changes and developments in the energy sector, some of which are the implementation of the TREP project (with GCF funding) and the Outer Island Renewable Energy Project (with funding from the ADB as well as the governments of Australia and Tonga).

In 2023, unofficial information suggests that 25 per cent of the electricity needs of Tonga are powered by renewable energy (Asian Development Bank, 2023).

In June 2023, Tonga announced a partnership with an Australian company to develop a wave energy technology project that could provide half of Tonga's energy and cut emissions by 20 per cent. This is the first project of its kind in the Pacific region (expected to be commissioned in 2025) and further indicates the commitment of the government to achieving the goal of 100 per cent renewable energy power generation by 2035.

b. Sustainable development in the energy sector and related policies

Table 5–3. Sustainable energy policies and strategies

STRATEGY	STATUS	BRIEF DESCRIPTION
Renewable Energy Act (2008)	Enacted	Provides the legal framework for promoting and regulating renewable energy development in Tonga. It defines the roles and responsibilities of the government, regulator, utility and independent power producers. It also establishes the Renewable Energy Fund, a mechanism for financing renewable energy projects.
Tonga Energy Road Map 2010–2020	Developed	A 10-year plan that is aimed at reducing Tonga's vulnerability to oil price shocks and increasing the quality and access to modern energy services in a financially and environmentally sustainable manner. It sets the targets and strategies for renewable energy developments, EE improvements, petroleum supply management, institutional and regulatory reforms, and capacity-building (Tonga, 2010).
Tonga Energy Road Map Plus (2020–2035) – TERMPLUS	Developed	An extension of the Tonga Energy Road Map that is aimed at achieving 70 per cent and 100 per cent renewable electricity generation by 2025 and 2035 respectively. It outlines the actions and investments needed to transform Tonga's energy sector and enhance its resilience to climate change impacts. It also addresses the challenges and opportunities for energy access, affordability, security and sustainability.
Energy Efficiency Master Plan (2020–2030)	Developed	Outlines the strategies and actions for Tonga to reduce its GHG emissions and increase its energy savings from all sectors. It was launched in December 2020 by the Government of Tonga, with the support of the Climate Technology Centre Network and the Pacific Centre for Renewable Energy and Energy Efficiency. The goals of the Tonga Energy Efficiency Master Plan are to reduce the energy intensity of the economy by 30 per cent by 2030 compared to a 2010 baseline and to reduce the electricity consumption of Tonga's sectors as follows: • Public sector by 50 per cent • Residential sector by 30 per cent • Commercial sector by 20 per cent • Transport sector by 30 per cent

[14] See https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Oceania/Tonga_Oceania_RE_SP.pdf.

STRATEGY	STATUS	BRIEF DESCRIPTION
Updated NDC	Submitted in 2020	Tonga submitted its NDC in December 2020 (Tonga, 2020). The ambition of the NDC was increased compared to the country's first NDC by defining and quantifying targets, specifying measures, and providing better communication and transparency methods. It set a 13 per cent absolute energy emissions reduction target for the energy sector by 2030 compared to 2006, through implementing renewable energy projects such as solar, wind, biomass and biogas; improving EE and conservation in the public and private sectors; developing and enforcing energy policies, regulations and standards; strengthening institutional and human capacities; and enhancing data-collection, monitoring and reporting systems in the energy sector.

c. Institutional roles and responsibilities in the energy sector

The Energy Road Map Institutional and Regulatory Framework Project in Tonga helped develop a coherent institutional and policy framework for the Tongan energy sector that would support its objectives of energy resilience, affordability, security and safety, access and reliability, as well as sustainability. It supported the establishment of the Tonga Energy Authority as the main regulator and planner of the energy sector. The Tonga Energy Authority is responsible for developing and implementing the Tonga Energy Act 2021 (Tonga, 2021), which sets out the roles and responsibilities of various stakeholders in the energy sector, such as the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communications (MEIDECC); Tonga Power Limited; the Renewable Energy Development Division; and the private sector.

- MEIDECC: The Ministry is responsible for coordinating and implementing the National Energy Policy and Strategy as well as overseeing energy sector reform and regulation.
- Tonga Power Limited: This is a State-owned enterprise that operates as the sole electricity provider and distributor in Tonga. It is also responsible for developing and maintaining the electricity network infrastructure and promoting renewable energy generation.
- Renewable Energy Development Division: It is a division under MEIDECC that supports the implementation of renewable energy projects and initiatives in Tonga, such as solar, wind, biomass and biogas. It also provides TA and capacity-building to stakeholders in the renewable energy sector.
- The Ministry of Finance also plays a role in macroeconomic policy and energy security in supporting sustainable development in Tonga.

3. GCF ENERGY SECTOR PORTFOLIO

NDA. The NDA in Tonga is MEIDECC.

AEs. In addition to IAEs and regional DAEs, Tonga has two national DAE applicants (the Ministry of Finance and Tonga Development Bank), but neither has been approved yet. Of the AEs that can develop projects in Tonga, only ADB has approved FPs in the energy sector (Table 5–4) (excluding proposals under the GCF's RPSP, which are reviewed further below).

Table 5–4. AEs with approved FPs

NAME OF AE	DATE OF ACCREDITATION	ACCREDITATION LEVEL
ADB	26 March 2015	International

Source: IEU DataLab

Readiness and project preparation in the energy sector. Tonga is a very active user of the GCF's RPSP. It has received a number of RPSP grants (Table 5–5), for a total of USD 6.45 million, two of which (total of USD 660,692) target the energy sector (focusing on renewable energy technologies, efficient and reliable energy transmission, distribution and storage, and low-emission energy generation).

Of particular importance for Tonga was the Assessment and Reform of the Tonga Outer Island Solar Electrification Society (OISES) project, as it is focused on the following activities:

- Supporting the necessary reform approaches for the sustainable development of off-grid new projects in the government pipeline, including FP090, where OISES helped strengthen the institutional framework to effectively implement the off-grid component under FP090.
- The identification of business model gaps in the operation, ownership and maintenance of off-grid renewable energy services and the implementation of proper actions to improve the current management of off-grid solar systems to increase their useful life beyond the one to two years of operation observed prior to the project.

Tonga developed a GCF CP in 2018 (Tonga, Department of Climate Change, 2018). The CP consolidates nationally driven priorities for GCF support based on existing policies and frameworks such as the Tonga National Strategic Development Framework (2015–2025) and the National Climate Change Policy (2016). It identifies six strategic areas for GCF interventions: energy, water, agriculture, coastal management, waste management and disaster risk reduction. In the energy sector, the programme prioritizes the following actions:

- Shifting from fossil fuel-based energy generation to RES such as solar, wind and biomass.
- Installing utility-scale energy storage systems to facilitate the integration of variable RES in Tonga's power grid and improve its reliability and resilience.
- Achieving a 50 per cent share of renewables in the country's energy generation mix by 2020 and a 70 per cent share by 2030. (This goal has since been updated to 75 per cent by 2025 and 100 per cent by 2030.)
- Reducing GHG emissions from the energy sector by 26 per cent by 2030, compared to the business-as-usual scenario.
- Increasing EE and conservation measures in the public and private sectors.

Table 5–5. Approved RPSP grants

FLUXX #	RPSP GRANT NAME	DELIVERY PARTNER	APPROVAL DATE/STATUS
1706-14716	Tonga – CTCN – Development of an Energy Efficiency Master Plan for Tonga	United Nations Environment Programme–Climate Technology Centre Network	2017/04/10 Disbursed
1705-14670	Tonga – NDA Strengthening + Country Programming	Tonga, Ministry of Finance and National Planning	2016/10/28 Completed

FLUXX #	RPSP GRANT NAME	DELIVERY PARTNER	APPROVAL DATE/STATUS
1810-15489	Tonga – Strengthening Adaptation Planning in Tonga	Tonga, Ministry of Finance and National Planning	2020/03/16 Disbursed
1902-15687	Tonga – NDA Strengthening and Country Programming (Phase 2) (Energy Sector)	Tonga, Ministry of Finance and National Planning	2019/10/31 Disbursed
1902-15688	Tonga – Assessment and Reform of the Tonga Outer Island Solar Electrification Society (OISES) for Engagement with the GCF-Approved Tonga Renewable Energy Project (TREP)	Tonga, Ministry of Finance and National Planning	2019/12/30 Disbursed
2007-16270	Tonga – Enabling Private Sector Access to Climate Finance to Strengthen Climate Resilience Development in Tonga	Tonga Development Bank	2021/01/28 Disbursed
2102-16711	Tonga – Rapid Readiness Support for Resilient Recovery in the Kingdom of Tonga	Tonga, Ministry of Finance and National Planning	2021/12/31 Disbursed
2107-16927	Tonga – Strengthening Resilience of the Water Resources Sector to the Impacts of Climate Change in Tonga	Tonga, Ministry of Finance and National Planning	2023/03/23 Legal processing
2106-16896	Building Capacity of Regional Direct Access Entity to Foster Climate Action in the Pacific	Secretariat of the Pacific Community	2021/12/30 Disbursed

Source: IEU DataLab

FPs in the energy sector. Tonga has received GCF financing for two FPs (FP036 and FP090).

- FP090 (TREP) is a project aimed at installing battery energy storage systems across four islands in Tonga to increase renewable energy penetration and grid stability, provide TA to the power utility and the government, and support the development of a regulatory framework for renewable energy integration and private sector participation.
- FP036, Pacific Islands Renewable Energy Investment Programme, is a programme aimed at supporting the development and implementation of renewable energy projects in 11 Pacific Island countries, including Tonga, through a blended finance approach that combines GCF grants and loans with co-financing from other sources. The programme covers various renewable energy technologies, such as solar, wind, hydro, biomass and geothermal.

Both projects are part of the broader Pacific Islands Renewable Energy Investment Programme, a regional initiative led by ADB in partnership with other development partners and AEs.

Tonga also has two concept notes under review by the GCF Secretariat (as of 6 January 2023), but they do not target the energy sector. They are focused on access to and the use of climate information and early warning systems. They also aim to build the capacity of the Tonga Climate Change Fund.

Table 5–6. Funded activity portfolio in the energy sector

PROJECT NUMBER	NAME	PUBLIC/ PRIVATE	SECTORAL GUIDE			AE	APPROVAL DATE / STATUS	GCF ENERGY INVESTMENTS (USDM)	TOTAL GCF BUDGET (USDM)	IMPACT (tCO_2E SAVED)
			Energy generation and access	Energy efficiency	Cities, buildings, and urban systems					
FP036	Pacific Islands Renewable Energy Investment Programme	Public	1			ADB	2016/12/15	17	17	2,100,000
FP090	Tonga Renewable Energy Project under the Pacific Islands Renewable Energy Investment Programme	Public	1			ADB	2019/09/06	29.9	29.9	265,055

Source: IEU DataLab

B. KEY FINDINGS

1. ALIGNMENT WITH THE GCF MANDATE AND TONGA'S ENERGY SECTOR NEEDS

The GCF's approach to energy sector development in Tonga and GCF's support is considered by all interviewed local stakeholders to be extremely relevant for the country's priorities and the market in general. The GCF is the single largest energy sector investor in Tonga, and all interviewees acknowledged that it is contributing to the market transition.

a. Alignment with the needs of the energy market

The GCF's energy projects in Tonga have transformative impacts on the country's energy sector. The GCF is the country's largest energy sector investor and is critical to the implementation to the Tonga Energy Road Map Plus (also known as TERMPLUS). Unfortunately, the GCF will not be able to contribute to the 2025 renewable energy target of Tonga beyond FP036 and FP090 due to the long project approval cycle. The private sector has already approached the NDA with a waste-to-energy project concept that, if submitted to the GCF, may not be approved, financed and commissioned before 2030.

There has been **substantial coordination with local market stakeholders** on GCF supported initiatives. Local stakeholders have been significantly involved in energy sector consultations and collaborate on GCF-funded projects in the energy sector. Certain stakeholders attend the steering committee meetings of the projects under the TREP and OISES.

The perception of all interviewees is that the GCF's support for Tonga has been heavily driven by the very active NDA, both in terms of prioritization and focus.

b. Delivery of the GCF mandate in the energy sector

As noted, the GCF is the largest energy sector investor in Tonga; as such, it delivers its market transformation mandate in the energy sector. However, the GCF is known to be very bureaucratic and slow in project appraisal times and the deployment of funding, which has the following effects:

- Project proponents are discouraged from seeking GCF support, in particular for smaller projects (under USD 20 million) and private sector projects, as the transaction costs of working with the GCF are considered higher than working with any other international financial institution (IFI). This view has been expressed by the NDA and ADB.
- It is difficult for the GCF to continue to contribute to the 2035 targets of Tonga due to the long GCF project approval cycle. As a small island nation, the average project investment size in Tonga is quite small. AEs are inclined to include Tonga in regional projects, which in turn further prolongs the project approval cycle.

Some interviewees questioned whether the GHG emission reductions through TREP contribute to global climate change mitigation, given Tonga's minimal contribution to GHG emissions.

2. CONTRIBUTION TO ACHIEVING TONGA'S CLIMATE GOALS

a. Likelihood of GCF energy sector projects achieving expected results

The midterm evaluation of FP090 and most of the interviewed stakeholders confirmed that TREP has already achieved its intended outputs. The GCF is contributing to the paradigm shift in Tonga in several ways:

- Providing access to energy in the Vava'u and outer islands. The original TREP design did not cover the outer islands, but the project realized savings in the implementation process, which have been utilized to expand energy access on the outer islands. The installation of solar systems on the outer islands will start later in 2023.
- Facilitating an easier future involvement of the private sector in renewable energy generation in Tonga, as the battery storage component of the project is oversized by design and able to manage renewable energy power generation capacity.
- Demonstrating to the market that renewable energy, coupled with battery storage, is a viable and sustainable alternative to diesel-based power generation to provide access to energy to the off-grid communities in Tonga and also to address the growing electricity demand in the country.
- Addressing a number of technical barriers to the growth of renewable energy generation in the country, such as grid management challenges.

b. Changes in the practices of the AEs and other stakeholders in Tonga triggered by GCF energy sector projects

AEs. During interviews, international development organizations expressed the feeling that AEs are fitting GCF projects within their own programmes and planning rather than following the priorities and needs of Tonga. AEs seek collaboration with other development agencies and IFIs only for projects for which they have limited funding. Such projects, according to some interviewees, do not always align with the NDC of Tonga.

NDA. Collaborating with the GCF has substantially contributed to the capacity of the NDA. The GCF's readiness support has been particularly helpful, not only in developing capacity within the NDA but also for the NDA to better understand the operational modalities of the GCF. As a result of this increased capacity, the NDA initiated the accreditation process for a national DAE, the Ministry of Finance, which is currently in progress. The NDA is also working to strengthen its relationship with the private sector to encourage more private sector projects to access the GCF Private Sector Facility.

Other stakeholders. There has been a learning curve in the market related to renewable energy. With GCF support for clean energy generation and energy access, there is noticeable capacity development in the market, but there is still a need to provide training to develop local capabilities and enable the operation and management of renewable energy grids by local talent.

c. Co-benefits of GCF energy sector projects in Tonga

The TREP project has created a number of co-benefits. It served to develop the local capacity of the MEIDECC office in implementing energy projects. On the outer islands, interviewees reported a massive improvement in quality of life – for example, the ability to preserve food, the impact on education by enabling students to do homework and study later in the day, and a general improvement of everyday life by extending everyday activities beyond sunset.

d. Unintended positive or negative results of GCF investments in Tonga

i. Positive

Apart from the increased capacity of MEIDECC to develop energy sector projects, the NDA reported that interacting with the GCF has also substantially improved the overall quality of MEIDECC governance in the following ways:

- Improving internal policy development processes by rendering them more consistent and structured
- Increasing the capacity to document processes
- Improving the capacity to develop climate adaptation and mitigation projects, to conduct feasibility studies and, in general, to analyse project parameters and impacts
- Improving the overall and operational efficiency of MEIDECC

The increased capacity of market players, developed by the GCF, is being used to develop and deploy other projects in the market. There has been a significant upscale of international funding for Tonga, which has benefited from this local capacity.

ii. Negative

There is no adverse impact on the environment observed as a result of GCF investments in Tonga.

3. Suitability and effectiveness of GCF Secretariat support in the approval and implementation process of energy sector projects

a. GCF approach to project origination and its alignment with the needs of the energy sector in Tonga

i. Alignment

The GCF projects in Tonga are well aligned with the country's priorities and objectives. Feedback from the NDA is that GCF project outcomes are fully aligned with the needs of the country and local communities. The GCF CP was developed in full alignment with Tonga's needs and priorities.

The GCF's approach to project origination has been reported by all interviewees to be aligned with the needs of the energy sector and those of the country (through country programming).

However, several interviewees raised a concern that the GCF project development and appraisal cycle does not always fit with the country programming cycle (that is, it is sometimes longer), which makes it difficult for the government to develop and implement planned GCF projects within the country programming cycle. Furthermore, because the market evolves rapidly, by the time GCF projects are approved and implemented, the market may need different types of support or the government may have different priorities, potentially rendering GCF projects "out of sync" with the market needs and priorities of the day.

ii. Efficiency of the approach

Interviewees reported that AEs are sometimes a bottleneck in the process of submitting FPs for planned/priority projects. The larger IAEs (e.g. ADB, International Bank for Reconstruction and Development (IBRD), UNDP) self-report as being "GCF fatigued" and are prioritizing internally where to seek GCF support to be able to design and deploy larger programmes. This puts SIDS, such as Tonga, at a disadvantage and has two negative implications for the overall GCF energy sector approach:

- **AEs are slowing down the stream of FPs** and are trying to aggregate/optimize their project pipeline for the GCF. ADB considers approaching the GCF for the whole Tonga pipeline (climate change, not specifically energy) but is still considering its conceptual approach internally. "GCF fatigue" is one of the reasons why a continuation of the TREP project has not yet been pursued by ADB or another AE (even though the country's planning for 100 per cent renewable energy power generation by 2035 relies on the implementation of a TREP-2 type project).

- Some of the interviewed stakeholders raised concerns that the **GCF project approval cycle drains the limited resources of the NDA,** and the government does not have the capacity to pursue more than one project at a time (Tonga has major adaptation and energy projects in development). When the national DAEs are approved, they will face the same challenges. The Ministry of Finance is reported to have similar capacity issues (shortage of time for existing staff to dedicate to the GCF, shortage of staff to fully dedicate to the GCF, and shortage of capacity in general related to the energy sector).

It is worth mentioning that the experiences of AEs and market stakeholders with GCF projects in Tonga date to between four and six years ago, when projects were appraised and approved. GCF processes have evolved since then, and this finding should be considered through the lens of present-day GCF operations.

b. Work of the GCF with relevant energy stakeholders in Tonga, including the network of AEs and executing entities

Considering the large number of readiness projects implemented in the country, the GCF's RPSP plays a pivotal role in Tonga, as a SIDS, in strengthening the NDA, raising awareness among stakeholders and creating an enabling environment for promoting renewable energy. Furthermore, the NDA effectively and actively uses GCF readiness support, whereas most traditional development partners only provide limited support to the government in the field of climate change. The vast majority of interviewees reported that the NDA does a very good job with stakeholder consultations related to GCF projects.

The GCF lacks coordination with the international community in Tonga. The international development organizations in Tonga hold regular coordination meetings (usually led by IBRD) at which the GCF is not represented. Interviewed representatives of international development organizations in Tonga expect the NDA 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 projects to the limit. This, in turn, can have a negative impact on overall future project development and implementation.

c. Assessment of the human capacity of the GCF Secretariat to support energy sector projects throughout their life cycle

Interviewees reported that the level of knowledge of the GCF Secretariat about the Tongan market context can vary significantly from person to person. Examples were provided whereby a more experienced GCF project manager was replaced with a less knowledgeable one in the course of a proposal appraisal, which in turn generated a round of additional comments and feedback based (as reported by interviewees) on the lack of experience of the second project manager. This perceived inconsistent approach to project appraisal by the GCF Secretariat was also attributed in part to a perceived high GCF staff turnover rate. The general perception among stakeholders in Tonga is that there is no succession and transition between task managers and that there is a lack of internal coordination within the GCF.

Interviewees reported that whenever they have dealt with experienced GCF Secretariat project managers the process was considerably faster. An example was provided related to the modification of the TREP project to redirect project savings to expand the project to the outer islands; the modifications to the project were approved without delays.

d. GCF sectoral guidance in the energy sector

Stakeholders in Tonga view the sectoral guides as useful but to be taken only as a guide, and they need to be adjusted to the specific context of Tonga.

The NDA is supporting the development of concept notes and FPs for the GCF in-house (not using consultants), and these refer to the guides extensively. According to the NDA, the guides are well developed and quite informative.

e. Comparison of the cost-effectiveness of GCF investments in energy with those of the private sector and/or other public finance institutions or development agencies

i. Higher GCF transaction costs

All market stakeholders reported that the GCF has higher transaction costs compared to ADB, IBRD and other multilateral and bilateral development organizations. The GCF was reported to have much more complicated processes and a slower project approval cycle, and to demand much higher capacity from AEs, the NDA and other stakeholders involved in the process of developing eligible projects.

Higher transaction costs are offset by the ability of AEs and the NDA to access substantial amounts of concessional and grant funding, to which other IFIs have much more limited access. In turn, AEs tend to prioritize larger projects (over USD 25 million) for which the amount of GCF funding would justify the project development time and associated costs.

The GCF was reported not to be cost-effective (in terms of transaction costs to access funding) for private sector projects in Tonga, in that individual project sizes are too small to merit going through the process.

ii. Cost-effective impact

In terms of cost-efficient market impacts of the GCF, interviewees could not compare the GCF with other public finance institutions and development agencies because the GCF is focused on different areas compared to the other development organizations.

In the energy sector in particular, the GCF is the largest investor at the moment, and this is likely to remain so for the near future due to the government's limited ability to raise additional debt for energy sector projects.

Tonga needs USD 671 million more in climate-related investments over a 10-year period, according to the IMF, USD 550 million of which will be needed to implement the Tonga Energy Road Map Plus between 2023 and 2035 (Global Green Growth Institute, 2023). Other stakeholders have expressed interest and committed to implementing renewable energy projects in Tonga, but the implementation of these has been generally delayed due to the COVID-19 pandemic.

4. Sustainability of the results and approaches of GCF interventions in the context of Tonga's energy market

a. GCF approach to ensure the sustainability of investments and socioeconomic co-benefits in the energy sector

GCF projects in Tonga are being implemented, with some components only recently commissioned, so it is not possible to identify the sustainability impacts of those investments. The fact that the government is considering both an extension of the TREP project (TREP-2) and different financing options is an indicator that TREP demonstrates the application of renewable energy investments in Tonga, and the market is willing to build on this momentum.

Some of the components of GCF support in Tonga are focused on access to energy, which does not necessarily reduce the carbon footprint of the country. While such projects may reduce the use of certain types of energy (e.g. shifting from cooking with wood to cooking with electricity), they add

to the grid communities that are likely to see increasing energy demand until that demand merges with the national average. Projects providing access to energy for these communities also need to support the adoption of energy-efficient lights, domestic appliances and equipment in communities. If increased energy demand outpaces supply, the likely result will be increased energy tariffs.

In SIDS, the levelized cost of renewable energy is typically higher than conventional energy. Whereas GCF projects are entirely funded with grants and do not impact energy tariffs, future private sector investments may result in increased energy tariffs. During the country mission, some interviewees raised concerns about the potential negative impacts of strong renewable energy penetration in Tonga on electricity rates and the social implications thereof, given Tonga's limited contribution to GHG emissions. Social pressure may, in turn, cool down the climate ambitions of the government and hamper the market momentum created by the GCF. Through its RPSP, the GCF is already addressing this issue by developing local capacity that is expected to lower the costs of the implementation and management of renewable energy investments. However, other SIDS with less active NDAs and fewer market development programmes are likely to be impacted more.

Diesel generation still has its place on islands and contributes to overall grid resilience in extreme climate events. It is likely that, as the share of renewable energy in the grid increases, diesel generation will still play a role as a backup grid management tool or to mitigate extreme weather events.

A potential sustainability concern of many of interviewees is that they will face challenges with project support in the period after equipment warranties have expired, due to limited local capacity for operation and maintenance. Exploring options for extending GCF technical support after project implementation was recommended beyond the current five years for TREP, with a focus on expanding local capacity for operation and maintenance.

b. GCF approach to innovation, replication and scaling-up its interventions in Tonga

The TREP is the largest investment in the energy sector in Tonga. As such, the project addresses a number of market barriers related to scalability and replicability, as follows:

- Establishing a pathway for the development and issuance of permits for large renewable energy projects.
- Addressing grid capacity and grid management barriers. The private sector is usually hesitant to invest in large-scale renewable energy generation unless it is certain that the grid can off-take and manage the produced energy. The battery management system of the FP090 is oversized by design to enable follow-up additions of new renewable energy grid capacity.
- Creating local operation and maintenance capacity.

However, future GCF funding to scale up this project is unlikely to happen due to the GCF's long project appraisal process. It is more likely that a future follow-up and scale-up on this project will be done without the participation of the GCF.

The NDA reported that it is not planning other programmes in the energy sector with GCF support at this time. Moreover, the Government of Tonga has an ambition to reach 100 per cent renewable energy power generation by 2035 but does not have the funding/borrowing capacity to do so via public sector projects. Consequently, it is likely that the necessary renewable energy generation to reach the target will be financed by grant funding from other donor agencies and private sector investments (via PPAs with Tonga Power).

5. COHERENCE BETWEEN THE GCF CLIMATE FINANCE DELIVERY WITH OTHER MULTILATERAL ENTITIES

a. Overall coordination with the international development community

The GCF does not directly coordinate with any international agencies and development organizations in Tonga, as its mode of operation relies on AEs. The downside of this approach is that international organizations, which are not AEs and not involved in ongoing GCF projects, know little about the GCF's energy sector approach and activities. Most interviewed local representatives of international development organizations did not know much about the GCF (e.g. the European Commission, New Zealand High Commission Office, Australian High Commission Office).

The GCF does not directly participate in international donor coordination meetings. Some of the AEs (such as ADB, IBRD) do participate, but the local offices that handle coordination do not know much about GCF projects in development. The overall consensus of the international community in Tonga is that there should be more direct GCF involvement/support in the market but with simplified procedures to access funding.

The consensus opinion of interviewed international development organizations is that MEIDECC or another government agency is in the best position to coordinate donor involvement and ensure that planned GCF support for Tonga is coherent with the planned programme activities of other international development agencies. The NDA recognizes that there is a need for improved coordination between the GCF and non-AE international development organizations active in Tonga, and it is planning to spearhead joint coordination calls that include the GCF to keep all parties up-to-date on government priorities, project progress, planning and information exchanges.

The lack of international coordination seems to be a major issue in Tonga in general. This is explained in part by limited capacity, reported high workloads of the small local offices of international development organizations, and the need for the Government of Tonga to step in and facilitate such coordination. IBRD is taking the lead on facilitating coordination among development organizations, but the NDA is not a party to this.

b. The GCF's comparative advantage compared to other multilateral funds in the context of the energy sector

The main and undisputed advantage of the GCF is the fact that it can leverage and provide **grant funding in much greater amounts than any other development organization** operating in the market. This was a consensus opinion of all interviewees. ADB, being the most active AE in Tonga, has limited funding allocations, and the GCF helps co-finance these. This is of particular importance for Tonga because the country's public debt is at an all-time high, amounting to about 42 per cent of GDP, and the government has no margin for further borrowing. In the near-to-midterm, energy sector investments in Tonga can only be financed by grant funding or private sector investments. In this regard, GCF grants are of critical importance to de-risk clean energy investments by creating local technical capacity to build, operate and maintain renewable energy systems and by improving the grid capacity to better manage renewable energy (through the financed integrated battery storage system).

Another major advantage of the GCF is **the RPSP,** which has had substantial success in **developing local capacity in the energy sector in general and at the NDA level**. Tonga is a very active user of the RPSP, with eight activities already delivered and seven more to be funded and delivered. Energy sector investors can now tap into this capacity for the development and implementation of future projects.

6. Consideration of gender-sensitive issues and approach to Indigenous Peoples

All interviewed stakeholders consider the private sector to be gender balanced in Tonga, with both male- and female-led businesses and a balanced representation of women throughout the market. This feedback was provided by all female and male interviewees. Climate resilience activities are led by women in Tonga, with only reforestation initiatives being predominantly led by men. GCF training, workshops and other capacity-building activities prioritize female-headed households.

All GCF projects have safeguard officers that report quarterly on gender-related key performance indicators.

As for the population, 98 per cent is of Tongan ethnicity, with the rest being immigrants from Asia, the Pacific, Australia and New Zealand. It is commonly considered that Tonga does not have indigenous minorities.

7. Country ownership and lead on GCF investments in the energy sector

All GCF investments are included in the NDC of Tonga. The NDC also includes planned projects by the European Union, New Zealand and Australia in different sectors.

The NDA is quite active in planning GCF supported activities and has a no-objection procedure in place to ensure country ownership and prioritization of planned GCF support. Plans are in place to further strengthen this procedure. Through this process, the NDA makes sure that all concept notes are aligned with regulations and the Energy Efficiency Master Plan and that the readiness support is sufficient and well balanced.

Currently, there is no formalized process whereby AEs share their investment plans for Tonga with the NDA. The NDA is taking steps to share Tonga's country programming with AEs and coordinate on this basis.

In terms of coordination with stakeholders, the main experience with the GCF revolves around the TREP project. The market sector interviewees have had no direct interaction with the GCF; the project was negotiated on another level, but they were extensively involved in the consultation process.

8. Fostering technical innovation and deployment of diverse financial instruments for the energy sector

TREP 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 offtaker. This demonstrates an innovative business model that the private sector can explore.

TREP has been instrumental in expanding energy access in Vava'u and has had a transformative impact on the grid there by reducing noise pollution from generators, some of which now only work intermittently as backups.

9. The extent of GCF energy sector investment replicability and scalability with the objective of transforming the market

TREP is the largest investment in the energy sector in Tonga. It has substantial replication potential in the outer islands, where it can be deployed on different scales, depending on energy demand.

Other development partners, inspired by the TREP project, indicated their interest in developing support programmes focused on home solar systems.

E-mobility ideas in Tonga are drawn from GCF projects in other countries and are being adapted for deployment in Tonga. Some private sector stakeholders have been proactive in searching the GCF website for information about projects deployed in different countries and then reaching out to Tonga's NDA for more information.

C. EMERGING LESSONS FOR THE GCF

The following emerging lessons for the GCF can be drawn from the Tonga case study:

- The GCF has **transformed the market** due to the large size of its investments. It has **achieved a market transformation and a paradigm shift** in Tonga and has developed renewable energy capacity at different levels in the market. This capacity is now being used to develop further projects for different development agencies. The paradigm shift can be observed on several levels:
  - **The Government of Tonga increased its ambitions for the share of renewable energy** in electricity generation from 70 per cent in 2030 to 100 per cent in 2035. This, in turn, indicates that it has a tentative project pipeline to achieve this ambitious target and, considering the limited ability of the Government of Tonga to raise further debt, the additional renewable energy generation is expected to come from the private sector and grant funding from international development organizations (the NDA confirmed that they are not planning new GCF project proposals in the near term).
  - The battery storage component of the TREP project substantially **increases the capacity of the grid to manage renewable energy** (an intermittent source of energy). The fact that it was oversized by design enables Tonga Power to easily add more renewable energy projects to the grid and distribute energy efficiently. This, in turn, allows for private sector projects to be interconnected on commercial terms (via power purchase agreements).
  - **The NDA and market stakeholders have accumulated substantial (for the size of the island) capacity in project development**, and this capacity is being put to use by the international community and investors (beyond the GCF), and they report increased development activities in the energy sector. Interviewees **attributed a large portion of this capacity to GCF RPSP support**.
  - GCF projects (including the RPSP) also **created local capacity to build, operate and maintain solar systems**, which de-risks solar photovoltaic projects for private sector international investors.
- **The GCF approval process does not factor in the level of sophistication of the target market**, and there has been a very steep learning curve at the NDA and market levels, resulting in delays in project approvals and deployment. The market would appreciate and greatly benefit from a simplified process such as the new GCF simplified approval process.
- **The ever-evolving GCF processes and templates are posing challenges to AEs and the NDA**, which increases the length of the already lengthy approval process. AEs are beginning to channel their project development efforts into larger-scale projects (either in countries able to deploy larger projects or in regional projects). The consequences of this are threefold:
  - It is expected (as confirmed by the NDA and some interviewed AEs) that the demand for Tonga-specific GCF projects will decrease in the future, and Tonga is likely to be a participant mainly in regional GCF projects. These projects may or may not be fully

aligned with Tonga's and market priorities, considering that they will target common regional needs and priorities.

  - **Private sector projects are less likely to seek GCF support in Tonga** due to the smaller size of such projects and the need for the private sector to find an AE willing to develop a concept note and FP with the GCF.
  - **The NDA will have more limited ability to align regional projects** with the country's priorities, and regional projects may be more favourable to the larger, more developed islands such as Fiji.

- The NDA and AEs would appreciate a GCF "hard NO policy" to not spend time and effort on proposals that are not well aligned with GCF. The efforts could be better directed to other priority projects that are a better match for the GCF. Not rejecting weak proposals gives AEs and the NDA false hope that projects (after a complete rewrite) can be approved. This, in turn, makes both AEs and the NDA expend more of their limited GCF capacity on such projects instead of prioritizing better concept notes and FPs. False project hope also keeps projects in the pipeline, resulting in back-and-forth communication that adds to the workload of GCF task managers.
- More advanced AEs, such as ADB, have expressed interest in exploring different work modalities with the GCF, whereby some aspects of the approval process would be delegated to AEs. Currently, some AEs such as IBRD, ADB and other IDBs already conduct their own analysis that, to an extent, overlaps with some of the GCF's evaluation areas, such as additionality, market transformations and paradigm shifts, gender equality, general risk analysis and safeguards, among others. If the GCF outsourced certain aspects of the evaluation process to AEs and only conducted a second-level review before accepting findings, the GCF would receive the following benefits:
  - **Qualified project appraisal teams at the AE level and shortened project appraisal times.** AE project and programme managers are also much more familiar with the target countries and markets. Such an approach would undoubtedly have to be selectively applied as some AEs have limited or no capacity to conduct this type of analysis.
  - **Ability to free up internal capacity** at the GCF Secretariat to keep up with the growing demand for GCF funds.
- The GCF's strategic positioning of allocation of the mitigation fund through renewable energy investments is murky. Some interviewees raised concerns that the contribution to climate change mitigation by expanding its renewable energy generation in Tonga is very minimal, given the limited GHG emissions from Tonga.
- Nonetheless, the energy sector investments of the GCF in Tonga are very relevant for SIDS as they are scalable, replicable and applicable in the market with varying regulatory frameworks. The FP090 project is not simply renewable energy capacity added to the grid. It removes barriers for follow-up renewable energy investments, thus de-risking the sector for private-sector investors. It is a successful case of a blended finance instrument bringing together different investors. The same or a similar structure can be used by the Government of Tonga, other SIDS, AEs or development organizations to attract much-needed private sector investors in the renewable energy sector in SIDS. It demonstrates that it is possible to create renewable energy market momentum in SIDS in a sustainable manner while also adapting to the local needs of remote communities, addressing local capacity and project management issues, and paving the way for the private sector to follow.

APPENDIX 5–1. LIST OF INTERVIEWEES

FULL NAME	FUNCTION	AFFILIATION
Akanesi Seinileva Tolu		MEIDECC
Alani Afu	Country Manager	Live and Learn
Alfred Leger	Site Manager	AKUO
Alfred Vaka	Programme Officer	JICA
Balwyn Faotusia	Senior Country Officer	ADB
Casie Cohen	First Secretary (Development)	Australian High Commission
Christopher Faleola	Adaptation Officer, Department of Energy	MEIDECC, Vava'u
Edwina Tangitau	Programme Manager (Energy)	Australian High Commission
Eleni Tevi	EU Programme Coordinator	European Commission Tonga
Eliate Laulaupeaálu	Principal Energy Planner, Energy sector team	MEIDECC, Department of Energy
Emeline Veikoso Laumanu	Energy Efficiency Specialist	MEIDECC
Ese Fulivai	Safeguard Officer	TREP
Estimoor Kaufusi	JNAP Specialist, Policy and Planning Division, Department of Climate Change	MEIDECC
Josh Helu	Managing Director	JH Electrical
Kalolaine Kavaefiafi	Officer in Charge/Finance Manager	Tonga Community Development Trust
Keasi Pongi	Executive Director	Civil Society Forum of Tonga
Lano Fonua	Investment Officer	Global Green Growth Institute
Lucy Faànunu	Officer in Charge	MEIDECC, Vava'u
Luisa Tuiafitu Malolo	Director for Climate Change, Department of Climate Change	MEIDECC
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		MEIDECC, Vava'u
Michael Ahokava		Tonga Power
Moala Loketi	Coordinator	Live and Learn Tonga
Natia Selu Lokotui	Development Officer	Civil Society Forum of Tonga
Paula Ma'u	Chief Secretary and Secretary to Cabinet	Prime Minister's Office
Pegalili Tohi		Tonga Power, Major Project
Sam Vea		Chamber of Commerce of Tonga
Simon Wilson	TREP PMU Programme Manager	TREP PMU, Energy Department
Sione Misi	Energy Planner	MEIDECC, Department of Energy

FULL NAME	FUNCTION	AFFILIATION
Teisa Atida	Accountant	TREP
Tetsuji Nakasone	Project Formulation Advisor	JICA
Vahid Fifita	Project Manager	Tonga Power

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

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6. ZAMBIA COUNTRY CASE STUDY REPORT

CONTENTS

TABLES

A. BACKGROUND AND CONTEXT

This country case study report has been prepared as an input into the Independent Evaluation of the Green Climate Fund's Energy Sector Portfolio and Approach, conducted by the IEU of the GCF. This report summarizes the results of the evaluation's Zambia country case study. This case study provides evidence of the results achieved (including unintended results) by GCF-funded activities in the country's energy sector; the GCF's comparative advantages for the country context; the coherence of GCF objectives at the country level, including the role of CPs in supporting energy sector objectives; and a country-level perspective on GCF support related to innovation.

This report is based on the results of a desk review, interviews (see Appendix 6–1), and a country mission undertaken between 31 July and 5 August 2023, which included sites visits to beneficiaries of the project FP148. The country mission team included Laurent Kossivi Domegni (Econoler Consultant) and Rishabh Moudgill (Policy and Evaluation Officer a.i. at GCF-IEU). Over the course of one week, the team conducted more than 20 interviews.

1. COUNTRY CONTEXT

Table 6–1. Overview of Zambia's country context

CATEGORY	COUNTRY
Demographics	The total population of Zambia is 19.6 million (2022 census) (Zambia Statistics Agency, 2022): • Female: 10 million; male: 9.6 million • Urban: 7.8 million; rural: 11.8 million Poverty rate (United Nations Development Programme, 2023): • 61.4 per cent of the population lives below the income poverty line • 23.9 per cent are vulnerable to multidimensional poverty • 21.0 per cent are in severe multidimensional poverty
GCF group status	African States, least developed countries
Governance conditions	According to the WB, Zambia is considered a stable country, with successful democratic elections held every five years. Zambia's democracy is evidenced by the nine presidential elections held and the four different political parties that have so far ruled the country (World Bank, 2023a). Still, according to the WB's six governance indicators (2021 data), Zambia ranks relatively low in Government Effectiveness (19th percentile), Control of Corruption (26th percentile), Rule of Law (30th percentile), Regulatory Quality (32nd percentile) and Voice and Accountability (35th percentile) and is average on Political Stability and Action Against Violence/Terrorism (48th percentile) (World Bank, 2023b). Fragile and conflict-affected State status: N/A (World Bank, 2022). Governance: After many years as a one-party State, Zambia became a multiparty State in 1991. The current President is Hakainde Hichilema.
Economic and development conditions	Economic sectors: According to the Zambian Development Agency, the priority economic sectors in Zambia include (i) mining, dominated by copper production, (ii) tourism, (iii) manufacturing, (iv) energy, and (v) agriculture (Zambia Development Agency, 2020). Outlook: According to the Word Bank, Zambia has faced recent challenges, including falling copper prices and the war in Ukraine, that have raised the cost of imports and contributed to the depreciation of the local currency, the kwacha, by more than 30 per cent. The country's recovery is expected to generate a gross

CATEGORY	COUNTRY
	domestic product (GDP) growth rate of 4.5 per cent between 2023 and 2025 (World Bank, 2023a). Country default: In 2021, Zambia was reported to be the first country of the post-pandemic era to default on its external debt. This debt included the arrears of the Zambia Electricity Supply Corporation (ZESCO) (the public utility) to independent power producers (IPPs). The country's debt rose to more than 130 per cent of GDP for several reasons, including the lockdown during the pandemic, the depreciation of the kwacha, and a dramatic decrease in the country's exports of goods and services (Nogueira Pinto, 2022). After the presidential election in 2021, the new government negotiated a bailout plan with the International Monetary Fund (IMF), which entails a USD 1.3 billion arrangement under Zambia's Extended Credit Facility programme over a period of 38 months. Three objectives are pursued by the Extended Credit Facility programme: (i) restoring sustainability through fiscal adjustments and debt restructuring; (ii) creating room in the budget for much-needed social spending; and (iii) strengthening governance and reducing the risk of corruption, including by improving public financial management (International Monetary Fund, 2023a). One of the requirements of the bailout plan is the reduction of subsidies to 1 per cent of GDP by 2025. According to the IMF, by the end of 2021, ZESCO's debt amounted to a total of USD 2.9 billion, including USD 1.5 billion in loans and USD 1.4 billion in outstanding payables to local and external IPPs (International Monetary Fund, 2022). The strategy being implemented to restore ZESCO's financial viability is as follows: • Introducing a cost-reflective tariff based on a multi-year tariff framework that reflects the cost of services (Energy Regulation Board, 2023) • Substantially reducing operating costs by renegotiating PPAs with IPPs and making voluntary cuts in the company's labour costs • Optimizing capital expenditures by reviewing non-committed investment projects • Initiating a process of optimizing and strategically divesting ZESCO's operating assets
Access to finance	In 2017, the Government of Zambia launched the National Financial Inclusion Strategy, the goal of which is to "achieve universal access to and usage of a broad range of quality and affordable financial services that meet the needs of individuals and enterprises." The Strategy's targets are to have 80 per cent of the population financially included (formally and/or informally) and 70 per cent of the adult population formally financially included by 2022 (Zambia, Ministry of Finance, 2017). Several strategies were developed to achieve the set targets, including the following: • The National Strategy on Financial Education for Zambia II 2019–2024 • The National Financial Sector Development Policy 2017 • The National Financial Inclusion Strategy 2017–2022 As a consequence of the default on external debt, Zambia has no capacity to borrow in the international financial markets in the near- to midterm, which may affect project sustainability and the country's ability to leverage private sector investors. According to the IMF, the Zambia banking sector's interest in private sector financing has been decreasing in recent years as a consequence of the sector's preference for seemingly low-risk, high-earning investments in government securities (International Monetary Fund, 2023b).
Climate change	According to the ND-GAIN Country Index, which summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience, Zambia is ranked 132nd out of 185 countries. The country is identified as highly vulnerable and has low readiness to tackle climate change issues. Zambia is the 56th most vulnerable country and the 141st most ready country (University of Notre Dame, 2022).

2. ENERGY SECTOR CONTEXT

The energy sector in Zambia is vertically integrated with the power utility, ZESCO, which owns the main power generation, transmission and distribution assets. However, the generation subsector has allowed IPPs to enter the market to address critical power shortages. The Zambia electricity market is a single-buyer market model. IPPs have ZESCO as the sole power offtaker, bulk retailer and grid operator of the interconnected system. Consequently, IPPs own their power generation assets but are constrained to sell their power to ZESCO through PPAs. PPAs put additional financial pressure on ZESCO's operational costs. In fact, in addition to its normal operations costs (salaries, operation and maintenance of energy generation assets, taxes, depreciation and amortization, etc.), ZESCO, as the sole power offtaker in Zambia, has to pay the various IPPs in honour of its legal commitment in the PPAs. However, it was realized that some of the PPAs were not well negotiated, and ZESCO is paying more than is required. Therefore, as part of the company's debt restructuring strategy, ZESCO is in the process of renegotiating PPAs with the IPPs. This will help to lessen the company's operational expenses.

The persistent key challenges in Zambia's energy sector include overdependence on hydro as the main electricity generation source, the low power tariff, ZESCO's lack of creditworthiness, the country's economic situation and low energy access, especially in rural areas.

a. Energy matrix

According to the Ministry of Energy (MoE), the total installed power generation capacity in Zambia stands at 3,356.6 MW (Zambia, Ministry of Energy, 2022c). The share of the various energy sources are as follows: 83 per cent hydro, 9 per cent coal, 5 per cent heavy fuel oil and 3 per cent solar.

The overreliance on hydro for power generation and on government subsidies has kept the electricity tariff too low for too long in Zambia. The country is the fourth last in terms of energy tariff ranking among the 12 countries of the Southern African Power Pool (Southern African Power Pool, 2022).

In addition, relying on hydro has made the power generation assets vulnerable to climate change, leading to a significant reduction in electricity generation and, consequently, leading to power outages. To address this issue, the Government of Zambia has decided to exploit the renewable energy potential of the country and allow for more IPPs in the power generation subsector.

Electricity consumption in Zambia is dominated by the mining sector, the largest power consumer, with a 51 per cent share; it is followed by the residential sector, which accounts for 33 per cent of consumption, and the remainder is consumed by other sectors, including the commercial and public sectors, at 16 per cent (Zambia, Ministry of Energy, 2022c).

In 2022, Zambia's electricity access rate was 34 per cent at the national level, representing an access rate of 76 per cent in urban areas and 8 per cent in rural areas (Kapala, 2022). By implication, 92 per cent of the rural population, nearly 11 million rural dwellers, do not have access to electricity. They still rely on expensive, polluting and unsafe alternatives such paraffin lamps, kerosene lamps and candles.

b. Sustainable development in the energy sector and related policies

Table 6–2. Sustainable energy policies and strategies

STRATEGY	STATUS	BRIEF DESCRIPTION
The Electricity Act, 2019	Enacted	The Electricity Act, 2019, makes the provision to regulate the entire value chain of the power sector and ensures energy security. It defines rules for power trading within and outside Zambia, promotes sustainable development and defines fair rules for interventions in the sector. The various provisions of the Act are as follows: • Electricity generation, transmission, distribution and supply • Acquisition of land and rights over land • Tariffs for retail customers • Rights and duties for retail consumers • Offences and penalties Under the Electricity Act, a function of the Energy Regulation Board (ERB) is to "secure a regular, efficient, coordinated, and economical supply of electricity and facilitate universal access to electricity supply", meaning that the ERB must provide for both grid-connected and off-grid consumers by ensuring that all the population has access to affordable energy (Zambia, 2019a).
The Energy Regulation Act, 2019	Enacted	The Energy Regulation Act, 2019, makes provisions for the functions and responsibilities of the power regulator, the ERB. In addition, it defines rules concerning licences, inspectorates, consumer affairs and dispute settling, and establishes an energy fund (Zambia, 2019b). The purpose of the latter, among other things, is to develop the energy sector.
The National Energy Policy, 2019	Enacted	The National Energy Policy provides an analysis of the energy sector, followed by definitions of the policy vision, rationale, guiding principles, objectives and measures, and the provision of an implementation framework. The overall objective of the Policy is to "achieve an optimal energy resource utilization to meet Zambia's domestic and non-domestic needs at the lowest total economic, financial, social, environmental and opportunity cost, and establish Zambia as a net exporter of energy" (Zambia, Ministry of Energy, 2019). This global objective is broken down into the following 10 specific objectives and policy measures: • To strengthen institutional capacity in the energy sector to be more responsive to the energy needs of the country • To strengthen regulatory frameworks to be more responsive to the energy needs of the country • To promote the efficient use of energy resources to conserve natural resources for the benefit of future generations • To promote the sustainable exploitation of biomass and alternative energy to wood fuel resources to increase socioeconomic development • To increase the exploitation of renewable energy to diversify the energy mix • To increase access to electricity to improve the livelihoods of citizens • To ensure the adequate, reliable and affordable supply of petroleum products and natural gas to increase the security of petroleum product supply • To promote private sector participation in the energy sector to ensure sectoral sustainable growth

STRATEGY	STATUS	BRIEF DESCRIPTION
		• To promote innovation, research and development in the energy sector to accelerate technological advances • To mainstream gender and climate change, as well as health and safety in the energy sector The policy measures to increase access to electricity for all citizens are to (i) expand generation, transmission and distribution capacity; and (ii) increase access to electricity in rural areas. There is a clear provision for energy access in the National Energy Policy.
Zambia Power Development Framework, 2021	Adopted	The Zambia Power Development Framework is one of the implementation frameworks of the National Energy Policy, which facilitates public and private sector investments in power development and sustainable development. In addition, it provides guidance for private sector investments in the power sector by detailing procedures and processes to be undertaken while involved in energy investments. Among other things, the Zambia Power Development Framework details the following: • The Zambian electricity supply industry • Processes and procedures for power development and operations • Permitting processes by selected government institutions • Business arrangements related to tariffs • Generation potential and power projects under implementation Identified power sources are hydropower, coal-to-power, solar power, waste-to-energy, wind power and uranium. A total of 13 power generation projects, totalling around 1,680 MW and exploiting various RES, have been identified as under development and/or implementation. Although this Framework is dedicated to the grid-connected subsector, it provides general guidance on rural electrification project implementation and mentions some existing off-grid generation infrastructure with a total capacity of 130 kW (Zambia, Ministry of Energy, 2021).
Energy Efficiency Strategy and Action Plan	Adopted	Based on the results of an analysis of the energy sector, the Zambian Energy Efficiency Strategy and Action Plan defines the vision, rationale and guiding principles, as well as establishes a plan, for each of the energy consuming sectors, including the residential, industrial and transport sectors. It also makes provision for an implementation framework. The vision of the strategy is to "improve the energy value chain through the efficient use of primary energy on the supply side and the efficient management of energy on the demand side to achieve sustainable socioeconomic development aligned with existing policy and national development goals" (Zambia, Ministry of Energy, 2022b). This vision is broken down into the following specific objectives: • To develop and establish a regulatory framework to support EE • To develop a common strategy to promote the utilization of best practices in industry by developing and adopting EE benchmarks specific to the Zambian industrial sector • To adopt market-based mechanisms to integrate EE in business practices • To utilize energy pricing as a tool to promote EE technologies • To implement awareness and capacity-building programmes for institutions, experts and the public to promote energy-saving policies and adopt standards and procedures while empowering women to support EE decisions and activities • To ensure coordinated collaboration of all stakeholders to achieve an energy-efficient economy Regarding the residential sector, the Action Plan is aimed at (i) developing and/or enhancing a regulatory framework for sustainable cooking

STRATEGY	STATUS	BRIEF DESCRIPTION
		technologies; (ii) banning the use of incandescent lamps and creating market-enabling tools for LED lamps; (iii) developing an energy labelling code for home appliances; and (iv) developing and enforcing the energy-efficient building code.
Renewable Energy Strategy and Action Plan, 2022	Adopted	Based on the results of a situational analysis, the Renewable Energy Strategy and Action Plan outlines the vision, rationale, guiding principles, strategic objectives and renewable energy targets of the country. In addition, it details the Renewable Energy Strategy as well as the activities of the Action Plan. The vision of this Strategy is to scale up renewable energy in Zambia, resulting in enhanced and wider access to modern energy services, improved national energy security, as well as increased sustainable national economic productivity and socioeconomic development (Zambia, Ministry of Energy, 2022e). The targets set for the Strategy by 2030 are as follows: • To add a total of 2,015 MW of renewable energy power by 2030. This will consist of 1,383 MW (68.9 per cent) in hydro, 500 MW (24.8 per cent) in solar, 130 MW (6.5 per cent) in wind, and 2.2 MW (0.1 per cent) in geothermal • To connect 4.829 million Zambians (19.1 per cent of the population) to mini-grids and 7.999 million (31.6 per cent of the population) to solar home systems (SHS) • To produce 92.8 million litres of bioethanol and 75.3 million litres of biodiesel • To disseminate 62,000 biogas digesters to households • To improve charcoal production efficiency from 20 per cent to 35 per cent and to disseminate alternative fuels and cookstoves This Strategy includes plans for the requirements to achieve universal access to energy for both households and agriculture through the use of solar photovoltaic mini-grids, small hydro mini-grids and SHS. Under the Renewable Energy Action Plan, the planned activities are to (i) develop and/or update the relevant policy and regulatory frameworks, (ii) undertake power sector reforms, (iii) develop innovative financing mechanisms, (iv) enhance information and knowledge dissemination, and (v) promote research, development, demonstration and deployment. Specific activities are dedicated to access to energy in rural areas, such as the enactment of mini-grid regulations, development of sustainable models for rural mini-grids, development of rural energy economic models, development of alternative payment systems for the off-grid market, development of public–private partnership models for rural markets, creation of an enabling environment for modern biomass energy, and development of a clean cooking strategy.
Gender Equality Strategy and Action Plan for the Energy Sector, 2022	Adopted	Based on the results of a gender situation analysis of the energy sector, the objectives of the Gender Equality Strategy and Action Plan (GESAP) for the energy sector includes several activities covering the various energy subsectors. The vision of this Strategy is that "Women and men have equal access and decision-making power to acquire clean, reliable, and affordable energy and technologies for productive and domestic use, and there is gender balance in representation and participation in all spheres of the sector" (Zambia, Ministry of Energy, 2022d). The GESAP is assigned five strategic objectives: • To increase access to and use of clean energy for domestic and productive purposes • To increase social and gender integration in energy infrastructure projects

STRATEGY	STATUS	BRIEF DESCRIPTION
		• To promote equal representation and participation of women as decision makers, employees and entrepreneurs in the energy sector • To strengthen institutional capacity to mainstream gender in energy policies, energy programmes and organizations • To increase coordination, collaboration and financing for gender equality in the energy sector This GESAP contributes to the inclusiveness and fairness of energy access endeavours in Zambia.
Revised and Updated NDC, 2021	Adopted	Zambia's revised and updated NDC built upon the country's first NDC that includes energy access as part of mitigation efforts targeting renewable energy and EE. The objective of the revised and updated NDC is "to promote the switching from conventional and traditional energy sources to sustainable and RES and practices and use of off-grid renewable energy technologies for rural electrification as decentralized systems" (Zambia, 2021). The dedicated energy access programme activities of the NDC include switching from existing isolated diesel to mini-hydro, to off-grid renewable energy for non-electrified rural areas using solar photovoltaic and wind, and grid extensions to non-electrified rural areas.
NAP, 2023[15]	Adopted	Zambia NAP was prepared through a process initiated in 2021 by the Zambia Water Partnership and was supported by a grant from the GCF RPSP. The NAP was planned to be delivered by the first quarter of 2023 but was delayed until late 2023 (Zambia, 2023b).

In addition to these policies and strategies, the following off-grid–specific documentation should also be mentioned:[16]

- National standards for solar off-grid systems and associated regulations
- The enactment of statutory instrument number 102 for tax exemptions on the importation of additional solar products
- A customs handbook for the application of statutory instrument 102

c. Institutional roles and responsibilities in the energy sector

The MoE is responsible for the development and management of energy resources in a sustainable manner. Among other things, the MoE is responsible for the development of RES and the provision of electricity, as well as the development and implementation of the energy policy and the nuclear energy policy. The MoE supervises the ERB, the Rural Electrification Agency (REA) and ZESCO (Zambia, Ministry of Energy, 2022a).

According to the Energy Regulation Act of 2019, the functions of the ERB are, among other things, to (i) issue licences; (ii) investigate and monitor the levels and structures of competition within the energy sector as well as develop and implement appropriate rules to promote competition in the sector; (iii) monitor the efficiency and performance of a licensee and an enterprise; (iv) disseminate information and promote the participation of the public in the provision of energy services; (v) receive, investigate and issue rulings on complaints from consumers; (vi) approve the location and construction of a common carrier or an energy facility; (vii) stipulate conditions relating to the location, installation or construction of a common carrier, an energy facility or an installation; (viii)

[15] Links to these documents are available at https://unfccc.int/sites/default/files/resource/NAP-Zambia-2023.pdf.
[16] These documents and others are available at https://www.moe.gov.zm/?page_id=2346.

design standards with regard to the quality, safety and reliability of energy supply; (ix) formulate measures to minimize the environmental impacts of activities carried out in the energy sector; and (x) determine, regulate and review charges and tariffs in the energy sector.

The REA was established by the Rural Electrification Act of 2003 (Zambia, 2003a). REA has the mandate to provide electricity infrastructure to rural areas of Zambia using appropriate technologies, to implement rural electrification programmes and to manage the Rural Electrification Fund. REA has developed both grid-connected projects and off-grid systems targeting solely rural areas. It works in partnership with the community and the private sector.

ZESCO, the public utility, is a vertically integrated government-owned electricity utility responsible for power generation, transmission, distribution and supply. According to the National Energy Policy, in 2019 ZESCO had generation assets totalling 2,348 MW, based mostly on hydro, and a million customers. To address power shortages due to the effects of climate change on hydro dams, ZESCO signed PPAs with several IPPs to increase power generation capacity.

Several IPPs own power generation assets in Zambia – for example, the Copperbelt Energy Corporation, Lunsemfwa Hydropower Company, Itezhi-Tezhi Power Company, Ndola Energy Company Limited and Maamba Colliery.

3. GCF ENERGY SECTOR PORTFOLIO

NDA. The NDA is the Ministry of Green Economy and Environment.

In 2017, Zambia was among the first countries to prepare a GCF CP. Although the CP mentioned energy as a priority sector to be targeted, there was no clear strategy on how to achieve this. Two energy projects are listed in the CP: (i) the Batoka Gorge hydropower plant, with a capacity of between 2,000 and 3,000 MW; and (ii) a mini-hydropower plant with a 60 MW capacity. The identified GCF pipeline consists of two concept notes: (i) the Zambia Mini-Hydro project, whose concept note is being developed; and (ii) the Livingstone Urban Water Supply, Sanitation, and Energy Efficiency Project. Both projects have not yet been developed into full project proposals.

The projects mentioned in the CP may not have been funded, but through the NDA Zambia has had three energy projects funded (via three proposals and one readiness grant).

AEs. In addition to IAEs and regional DAEs, Zambia has two national DAEs: the Development Bank of Zambia (DBZ)[17] and Zambia National Commercial Bank PLC (ZANACO) (Table 6–3). In addition, the Ministry of Finance and the National Savings and Credit Bank are also in the process of becoming accredited.

Table 6–3. National DAEs in Zambia

NAME OF DAE	DATE OF ACCREDITATION	ACCREDITATION LEVEL
DBZ	1 July 2021	Direct (national)
ZANACO	19 October 2022	Direct (national)

Source: IEU DataLab

Readiness and project preparation in the energy sector. Zambia has received one RPSP grant in the energy sector (Table 6–4).

[17] DBZ has been placed under possession by the Bank of Zambia (the central bank); according to the NDA, there are plans underway to create another development finance institution.

Table 6–4. Approved RPSP grants in Zambia

FLUXX #	RPSP GRANT NAME	AMOUNT (USD)	DELIVERY PARTNER	APPROVAL DATE/STATUS
1909-15928	Zambia – National Framework for Leapfrogging to Energy-Efficient Appliances and Equipment in Zambia (Refrigerators and Distribution Transformers) Through Regulatory and Financing Mechanisms	347,838	United Nations Environment Programme–Climate Technology Centre and Network	31 December 2019 Completed

Source: IEU DataLab

1909-15928. The objective of this readiness activity is to develop a regulatory framework and an agreed upon minimum energy performance standard and labelling scheme for refrigerators and distribution transformers. Two outcomes are defined for the project:

- The first outcome is aimed at improving the country programming process by (i) conducting a comprehensive market analysis for higher-efficiency refrigerators and distribution transformers; (ii) assembling key stakeholders for the design and future implementation of a national policy road map for the promotion of higher-efficiency refrigerators and distribution transformers; and (iii) enabling periodic reviews of the outcomes produced by the project through active stakeholder engagement with youth and gender engagement in technical committees as well as public consultations.
- The second outcome is aimed at establishing climate finance strategies and strengthening the project pipeline by developing a national policy road map for refrigerators and distribution transformers and by facilitating the design of financing mechanisms for the promotion of higher-efficiency refrigerators and distribution transformers.

The readiness project ended in 2019 and succeeded in producing a road map for the promotion of energy-efficient refrigerators and distribution transformers. The road map was handed over to the MoE for implementation. To date, implementation has not been done because of the lack of funding.

Projects in the energy sector. Zambia has received GCF funding for three energy sector-related projects, two of which are under implementation and one of which has been recently approved (Table 6–5).

- **FP080:** The "Zambia Renewable Energy Financing Framework" is the only nationwide FP implemented by the African Development Bank (AfDB), an IAE. The FP's objective is to support the efforts of the Government of Zambia to diversify the energy generation portfolio by increasing the share of new and renewable energy amid the power crisis and by increasing energy access through off-grid solutions, including mini-grids and SHS. The FP has two components: (i) the first component, "senior debt and standby loans to small-scale renewable energy IPP projects", is aimed at providing financing for 100 MW solar projects and small hydro projects (with a capacity of up to 20 MW); (ii) the second component is purely dedicated TA aimed at improving the investment framework for off-grid electrification by strengthening policy and institutional capacity as well as building the capacity of financial institutions. FP080 has been under implementation since February 2020 and has received one disbursement.
- **FP148:** The "Energy Access Relief Facility (EARF)" is a multi-country FP implemented by ACUMEN, a private sector IAE. The objective of this FP is to provide concessional debt funding to companies that provide access to energy during the post-pandemic COVID-19 period, to enable them to remain solvent, maintain staff and supply lines, and be positioned to drive the post-COVID-19 recovery. Specifically in Zambia, the EARF estimated the demand

from 15 companies at over USD 3 million, which will help to maintain services for over 2.4 million customers and could potentially preserve approximately 1,060 jobs.

- **FP205:** The "Infrastructure Climate Resilient Fund (ICRF)" is a newly approved multi-country FP implemented by the Africa Finance Corporation, an IAE. It has three outcomes: (i) blended finance is mobilized at scale to accelerate climate-resilient infrastructure (CRI) investments in beneficiary African countries; (ii) improved climate risk assessments and adaptation solutions for CRI and improved capacity for scaling up CRI in Africa; and (iii) a strengthened regulatory framework and innovative climate risk parametric insurance to be mainstreamed for the long-term viability of CRI investments in Africa. Although the FP is not primarily an energy investment, it is aimed at financing some energy projects as part of CRI investments.

Table 6–5. Funded activity portfolio in the energy sector

PROJECT NUMBER	NAME	PUBLIC/ PRIVATE	SECTORAL GUIDE			AE	APPROVAL DATE/ STATUS	GCF ENERGY INVESTMENTS (USDM)	TOTAL GCF BUDGET (USDM)
			Energy generation and access	Energy efficiency	Cities, buildings, and urban systems				
FP080	Zambia Renewable Energy Financing Framework	Private	X			AfDB (IAE)	1 March 2018 Under implementation	52.5	52.5
FP148	Participation in Energy Access Relief Facility ("EARF")	Private	X		X	ACUMEN (IAE)	13 November 2020 Under implementation	30	30
FP205	Infrastructure Climate Resilient Fund (ICRF)	Private				Africa Finance Corporation (IAE)	16 March 2023 Approved	253.8	253.8

Source: IEU DataLab

B. KEY FINDINGS

1. OVERVIEW OF THE ENERGY SECTOR'S SPECIFIC CHALLENGES

The energy sector in Zambia faces many challenges that hinder its development and prevent most of the population from having access to electricity and modern cooking services. These challenges include the following:

- **Lack of energy access:** According to MoE data, the electricity access rate was 34 per cent in 2022, meaning that more than 65 per cent of the population does not have access to electricity (Kapala, 2022). This figure can be disaggregated into 76 per cent of the urban population and only 8 per cent of the rural population having access. Hence, less than one in 10 rural dwellers have access to electricity. It is worth mentioning that low-income households in urban areas where the grid reaches and peri-urban households far from the grid also do not have access to electricity.
- **Lack of regulation of the off-grid sector:** ZESCO is the power distributor in charge of connecting Zambian households to the national grid. The tariffs applied by ZESCO to its clients are regulated by the national regulatory institution, the ERB. Therefore, consumers connected to the main ZESCO grid are subject to a national regulated tariff set by the ERB. Electricity access to off-grid consumers is the responsibility of the REA. However, the tariffs for off-grid consumers connected by mini-grids and SHS are not regulated by the ERB. They are determined at the project level on a case-by-case basis during negotiations between the REA and the off-grid project developer. As a result, the rural population often pays more for electricity than certain urban dwellers.
- **Low electricity tariffs:** Electricity tariffs were so low and not cost-reflective for so long because they were highly subsidized and power generation was mostly based on hydropower. With the effects of climate change, reservoir water levels have diminished, thus negatively impacting energy supply. The energy tariffs were not attractive for the private sector and were a challenge for private sector investments in the power sector. Based on the results of a cost-of-service study, new multi-year 2023–2027 electricity tariffs applied by ZESCO were approved by the ERB. Although these new tariffs are still not fully cost-reflective, they were high for average Zambian households. Consequently, households that adopted electric cooking technology are now forced to abandon it for alternatives such as charcoal and firewood. Nevertheless, it is worth highlighting that there is a social tariff applied to the base-of-the-pyramid customers with lifeline units of 100 kWh. For them, the current electricity tariffs are lower than those they were paying previously.
- **Unstable macroeconomic situation of the country:** As mentioned above, Zambia defaulted in 2021 for many reasons, including ZESCO's outstanding debts to IPPs, the lockdown during the pandemic that slowed down economic activities, the depreciation of the local currency against the USD, and a dramatic decrease in the country's exports of goods and services. This situation has badly affected the energy sector, which was also part of the problem. Due to the default, the power utility ZESCO, the only national offtaker, was not able to fulfil its commitment towards IPPs. In addition, many of the renewable energy programmes and projects, including FP080, were put on hold.

2. CONTRIBUTION TO ACHIEVING CLIMATE GOALS IN ZAMBIA THROUGH GCF ENERGY SECTOR PROJECTS

According to interviewees, the projects submitted to the GCF, including approved projects and concept notes, are fully in line with the country's climate commitments as stipulated in the NDC. In addition, the MoE, which oversees Zambian energy policy development and implementation, is one of the institutional stakeholders that sit on the national project selection committee at the NDA. The MoE has also participated in the process of updating the NDC, ensuring alignment with the country's energy policy. It is worth noting that part of the GCF readiness grant committed to the development of the NAP was used in the NDC updating process to reinforce alignment among climate policies.

Furthermore, some of the interview respondents affirmed that 80 per cent of the concept notes submitted to the NDA for submission to the GCF are in the energy sector. However, due the lack of capacity of Zambian project developers, many of the concept notes submitted to the GCF were returned with numerous comments. Therefore, there is a real need for (i) a national capacity-building initiative on the GCF FP cycle, and (ii) early financing for project origination and development to bring projects to maturity.

a. Likelihood of achieving expected GCF energy sector project results

The likelihood of achieving the expected GCF energy sector project results in Zambia is low, according to feedback from interviewees as well as the results of data analyses and the literature review. FP080, which is the only country project, has two components: Component 1 dedicated to investment and Component 2 dedicated to TA. Component 1 is the major financing component of FP080, representing more than 95 per cent of the GCF commitment. It is currently on pause due to national issues, such as (i) the country default in 2021; (ii) ZESCO's lack of creditworthiness because it was unable to fulfil its legal commitments to the private sector; and (iii) that IPPs, being risk averse, cannot invest in a context wherein the only power offtaker is not creditworthy. In addition, Component 2 of FP080 has received only 40 per cent of its funding commitment, representing 2 per cent of total GCF funding commitments. For the remaining projects, only a few solar companies benefited from FP148, which was signed during the COVID-19 pandemic with implementation delays, and FP205 has been recently approved but has had no disbursement. Available results are related to the portion of funding received for FP080 that was devoted to TA and to the achievements of solar companies under FP148. As part of the first full year of FP148 implementation, the IAE reported the following results:

- Achievements: 75 borrowers with 1,375 new jobs created
- Avoided emissions: 3.4 million tCO_2 in 2022
- Green jobs created: 11,700, including 3,150 jobs for women
- Capacity installed: 5.27 MW completed and aiming at 24.47 MW for the whole project
- Lives impacted: 2.7 million lives in 500,000+ homes

However, these data are for the whole of FP148, a multi-country project, and only a portion of these results relates to Zambia.

To improve the achievement of the results of GCF projects, countries' national contexts have to be factored into project implementation, and close project monitoring of multi-country projects is needed to ensure that resources are fairly distributed among countries.

b. Changes in practices of AEs and other stakeholders in Zambia, triggered by GCF energy sector projects

In addition to IAEs implementing projects, Zambia has two national DAEs: DBZ, accredited in 2021, and ZANACO, accredited in 2022.

During interviews, an IAE mentioned a change in practices through GCF support; they are now able to complete a gender assessment at the beneficiary company level, as well as develop and monitor the implementation of gender action plans. In addition, environmental and social governance policies and practices are reinforced at beneficiary companies.

It was not possible to interview DBZ during the country mission because it was taken over by the Bank of Zambia in July 2023. According to the press statement of the notice of taking possession of DBZ, DBZ was non-compliant with the country's banking and financial services regulations, especially the capitalization requirement (Bank of Zambia, 2023).

ZANACO, recently accredited, has not yet submitted projects to the GCF. However, interviewees noted two changes in their practices due to the requirements of the accreditation process.

- The first change is related to their ability to extend the terms of their loan products as a result of long-term GCF funding. ZANACO, as a commercial bank, is obliged by banking regulations to offer a maximum of five-year loan terms. However, with GCF funding, they can extend the loan maturity to more than five years to match the needs of climate projects.
- The second change is related to the improvement of their gender policy. Before being accredited, ZANACO had a gender policy that was only for internal application. With accreditation, the existing policy has been updated with requirements for gender audits and action plans at the client level.

Lastly, interviewees mentioned that the GCF has succeeded in directing the policy focus of the energy sector towards the development of clean and RES. Previously, the country had invested in coal-fired power plants and thermal power stations to address power shortages.

c. Co-benefits of GCF energy sector projects in Zambia

The final beneficiaries of FP148, who have adopted SHS for electricity access, mentioned the following co-benefits:

- Household financial gains: These are due to (i) the adoption of the SHS, which are cheaper than their alternatives (paraffin lamps and candles), and (ii) beneficiaries are saving the money that they previously spent on transportation costs to buy the alternative lighting sources.
- Positive impact on business revenues: Some beneficiaries reported that they have doubled their business income using SHS for lighting. In addition, a sales agent reported that he shifted from a low-paying job to the sales agent job and this increased his revenues.
- Adoption of information and communication technology: Beneficiaries who were not using smart mobile phones now use one to pay for their electricity consumption in a solar "pay-as-you-go" model.
- Increased demand for solar-powered appliances: After adopting and successfully testing SHS, rural household demand increased for more off-grid technologies such as solar fridges and solar pumps for productive activities, meaning that SHS have created demand for more off-grid technologies.
- Positive impact on education: Households that adopted SHS reported an improvement in their children's education results because they can now study in better conditions.

- Positive gender impacts: Women who adopted SHS reported increased social prestige and recognition among peers in the community.

d. Major positive and negative elements contributing to or hindering the achievement of project results

It was not possible to identify any positive elements contributing to the achievement of project results in Zambia.

The negative elements preventing the achievement of project results in Zambia are as follows:

- The COVID-19 pandemic brought many delays in project implementation.
- The negative country macroeconomic situation, with the ongoing IMF debt-restructuring programme, limits investment and makes it impossible to borrow internationally to leverage private sector funding.
- ZESCO's lack of creditworthiness has been a challenge for FP080 implementation, the investment component of which is on pause. It has also slowed down additional private sector investment in the energy sector.
- The wrong signals are being sent to potential private sector investors due to a lack of regulation and an enabling environment in the off-grid sector.

e. Unintended positive or negative results of GCF energy sector investments

The evaluation team has not identified any unintended positive or negative results so far, mainly because most projects are still at the implementation stage.

3. Suitability and effectiveness of the GCF Secretariat support in the approval and implementation process of energy sector projects

The Zambia CP[18] was launched in 2017 and may be outdated, thus not reflecting the current country situation (country default, ZESCO creditworthiness, energy access challenges, COVID-19 impacts, updated NDC, etc.). The Zambia CP needs to be updated to support and align project preparation with the needs of the energy sector.

The findings highlighted below are based on FP080 and FP148, as well as interviews with the NDA and AEs.

a. The GCF approach to project origination and its alignment with the needs of the energy sector in Zambia

Zambia is a vulnerable country, and as a result some project developers in the country lack the technical capacity to prepare and submit structured concept notes to the GCF Secretariat. This is exemplified by the fact that all FPs that currently benefit Zambia are only submitted by IAEs. As a result of the lack of technical and financial resources, one of the interviewees mentioned that 80 per cent of the energy project concept notes validated at the national level by the national selection committee and sent to the GCF Secretariat were sent back with comments, which demonstrates GCF Secretariat's lack of knowledge about the country context. Furthermore, another interviewee insisted

[18] The Zambia CP is available at https://www.greenclimate.fund/sites/default/files/document/zambia-country-programme.pdf.

that the comments received after submitting the concept notes did not consider the country's specific cultural and social contexts and national perspectives.

Many of the projects submitted to the GCF by Zambia, a developing country, include development components as well as climate components that provide additionality. However, the GCF does not want to finance the development components of projects, even though these are intertwined with climate components, making them mutually supportive. In fact, energy projects are intuitively a mix of development and climate impacts, and in the Zambian context it is hard to draw the line between development outcomes and climate mitigation strategies. The GCF is very clear that it does not want to finance development projects but rather only climate-related projects that act as an additionality to development projects. This is the main reason the GCF is not faring so well in agriculture-, energy- and mitigation-related projects that heavily rely on development-related components. However, climate benefits cannot be separated from development benefits. There is, therefore, a need for not only more support for Zambia to build national capacity in the GCF project cycle and the requirements thereof, but also early financial support in project preparation.

Additionally, the lengthy and complicated GCF processes make the risk for private players high. This is because there is a risk that projects from the Zambian private sector may not go forward, and this reduces the bankability of investing in GCF projects.

b. Work of the GCF with relevant energy sector stakeholders, including the networks of AEs and executing entities

The relevant national energy stakeholders in Zambia are the MoE, the ERB, the REA, ZESCO, the Global Energy Transfer Feed-in Tariff (GET FiT) programme,[19] and the Association of Power Companies of Zambia (APCZ).

The GCF project FP080 directly involves the MoE and REA through the implementation of the TA component. Specific work packages were allocated to the MoE and REA to improve the regulatory framework and foster an enabling environment for energy access projects.

The other institutions are not directly involved in any of the ongoing GCF projects but assume consultative roles in project implementation. Some of the institutions, such as the ERB and APCZ, have not heard of the GCF and did not know about available opportunities and processes. This calls for more outreach and capacity-building activities targeting the various stakeholders in the country's energy sector.

c. Compliance of GCF energy sector projects with GCF environmental and social safeguards

FP080 has submitted reports to the GCF on environmental and social safeguards (ESS), including an environmental and social impact assessment, an environmental and social management plan, and a resettlement policy framework.[20] As the investment component of FP080 is on hold, the implementation of these plans could not be verified during the country mission.

Although FP148 did not provide an ESS report, beneficiaries comply with ESS requirements. As an illustration, one of the beneficiaries of FP148 in Zambia has an environmental and social management strategy in place.

[19] GET FiT Zambia is designed by the Zambian MoE and implemented by the German development bank KfW through the implementation of its Renewable Energy Feed-in Tariff (REFiT) Strategy. GET FiT aims to procure 200 MW in renewable energy capacity. More information is available at https://getfit-zambia.org/.
[20] Links to these documents are available at https://www.greenclimate.fund/sites/default/files/document/ess-report-fp080-afdb-zambia.pdf.

d. Assessment of the human capacity of the GCF Secretariat to support energy sector projects throughout their life cycle

Interviewed stakeholders involved in project preparation and/or implementation with the GCF value and appreciate the support they received from the GCF Secretariat. However, they mentioned long delays in responses and high staff turnover at the Secretariat, which did not allow for straightforward and timely communications between involved parties. In addition, some interviewees highlight the need for the GCF Secretariat to appraise project proposals with an African context lens. This suggestion is reflected in quotations from interviewees such as "Africa needs African solutions" and "GCF staff looking into African projects need to have the African context".

e. GCF sectoral guidance in the energy sector

As per the interviews, while the surveyed AEs are aware of the existence of sectoral guides in the energy sector, these guides are not used widely. There is potential for more awareness-raising around existing sectoral guides to increase their usage among AEs and other stakeholders.

f. GCF policy and governance framework in the energy sector

The GCF policy and governance framework is well known by interviewed AEs and the latter are used to being involved in project submissions to the GCF. There was a comment from an interviewee that the GCF has too many committees with different experts and requirements and that these add too many delays to the project submission process. In addition, the country context of vulnerability and fragility means stakeholders feel like there are more requirements than are demanded elsewhere.

An interviewee also suggested improving and simplifying the project approval process, considering the vulnerability and fragility of African countries such as Zambia. The country has yet to take advantage of the recently approved simplified approval process of the GCF while submitting some of their projects.

g. Comparison of GCF energy sector investment cost-effectiveness with those of the private sector and/or other public finance institutions or development agencies

Interviewees stated that the main comparative advantage of the GCF is its ability to leverage concessional (deeply subsidized) funding in large volumes, which is needed by developing countries such as Zambia to implement energy sector projects. During the country mission, the team realized that several institutions in Zambia are willing to be accredited by the GCF to have access to the concessional resources. Nonetheless, stakeholders demand more flexibility in the GCF approval process for vulnerable African countries. One of the IAEs commented that the GCF needs to be more willing to take on the role of risk taker by deploying first-loss financial instruments.

From a private sector perspective, it was said that GCF project design is lengthy and costly compared to other sources of finance. In addition, project proposals from the private sector have difficulty obtaining the support of AEs; IAEs do not demonstrate interest in locally driven proposals, and national AEs are recently approved with no track record. Consequently, there is low interest from private sector players to originate projects due to the high risk that all of the efforts invested in project development will be wasted since there is no guarantee of approval from the GCF.

4. Sustainability of the results and approaches of GCF interventions in the context of global and Zambia's energy sector specifics

a. The GCF approach to ensuring sustainability and socioeconomic co-benefits of energy sector investments

It is too early to comment on the achievement of the socioeconomic co-benefits of FP080 due to the low level of project implementation. Component 1 is on pause and Component 2 is at the request for proposal stage. However, it is worth mentioning that socioeconomic co-benefits are listed in the FP, including green jobs creation; increased, stable and affordable energy access through on-grid, off-grid and mini-grids; and reduced reliance on fossil fuel for power generation.

For FP148, achieved socioeconomic co-benefits include household financial gains, positive impacts on business revenues, adoption of information and communication technology, increased demand for solar-powered appliances, positive impacts on education and positive gender impacts. All these co-benefits are listed and detailed above in section 2.c.

b. Sustainability of outcomes of GCF interventions in the energy sector

It is too early to discuss the sustainability of FP080 because its investment component is on hold. For FP148, the IAE (ACUMEN) provides post-investment targeted training support and capacity-building to beneficiary enterprises to strengthen their operations. Before accessing the Fund, many locally owned enterprises are supported in restructuring their operations by aligning them with international best practices.

c. The GCF approach to innovation, replication and scaling-up of its interventions to support transformation and a paradigm shift in Zambia

Due to the early implementation stage of projects, it was not possible to determine the GCF's impacts related to innovation, replication and the scaling-up of energy sector investments.

5. Coherence between the GCF and climate finance delivery with other multilateral entities

a. The GCF's comparative advantage compared to other multilateral funds in the context of the energy sector

Multilateral funds investing in the energy sector in Zambia include the WB, the European Union, the United Nations Development Programme, KfW and the AfDB. Interviewees mentioned them as performing better in Zambia compared to the GCF. In fact, some interviewees mentioned that project development with the GCF takes too much time compared to other international finance institutions whose finance can be accessed straightaway. It was said that GCF accreditation takes four years on average, and project development adds almost more two years. Within this time frame, many changes occur and the initial context under which the project was developed may change. Consequently, the project may no longer be relevant. In addition, interviewees mentioned the stringency of some GCF rules, especially concerning project implementation. The long process for accreditation and project appraisal before accessing GCF funds and the stringent requirements in project implementation also contribute to the challenges faced while programming with the GCF.

Before FP080 was put on hold in 2021, GCF concessional resources were instrumental in supporting a private sector investor to be among the three bidders to win a solar power plant development project as part of the GET FiT programme supported by KfW. It was reported that the bidding price

for GET FiT, including that of the private sector investor supported by FP080, was then the lowest in sub-Saharan Africa. GCF concessional funds would have brought real change in the Zambian context if not for national circumstances that forcefully brought the project to a halt.

FP148 is supporting last-mile solar distribution companies that bring electricity to remote rural areas and the dwellings of poor and vulnerable populations. GCF funds help to connect these rural populations; otherwise, they would have to wait several years before being reached by the interconnected grid.

b. Effectiveness of the GCF's additionality in energy sector projects

GCF funds in Zambia are additional in three ways. First, funded projects (FP080 and FP148) prevent Zambians from using harmful, dangerous and polluting alternatives such as coal and hydrocarbons for energy generation and electricity access. Through FP148, especially, rural Zambians have access to clean, affordable and reliable energy.

Second, FP148 and FP080, through their TA components, are addressing non-financial barriers such as the lack of capacity, lack of technical studies and an unattractive investment environment in the Zambian energy access market. Implemented activities serve to remove non-financial barriers that can prevent energy access projects from being implemented.

Third, the GCF is addressing financial barriers to investment in renewable energy development and energy access in vulnerable countries such as Zambia. This is accomplished through the provision of concessional funding (with a low-interest rate and longer tenure) where it is most needed.

6. GCF ENERGY SECTOR PROJECT APPROACH REGARDING GENDER EQUALITY AND INDIGENOUS PEOPLES

a. Gender equality and Indigenous Peoples considerations and energy project results

Gender is well mainstreamed in GCF-funded projects in Zambia. The two FPs considered in this report, FP080 and FP148, have both developed a gender assessment and gender action plan as part of their FP submissions.[21] These documents include the identification of vulnerabilities and their proposed mitigation measures. Many more actions were taken by the AEs and executing entities to mainstream gender into project implementation. In the FPs, gender-specific vulnerabilities identified are linked to (i) the low participation of women in the energy sector value chain, especially as entrepreneurs; (ii) the low energy access rate in rural areas, at less than 10 per cent; (iii) poverty constraints especially on women; and (iv) the low access of women to climate finance.

To address these challenges, the planned mitigation measures include (i) support for skills development and training for women entrepreneurs; (ii) facilitation of women's access to climate financing; (iii) support for apprenticeships for young women in energy sector-related occupations; (iv) support for a process to build a body of knowledge on women in energy in Zambia; (v) protecting female staff and agents; and (vi) ensuring ongoing access to renewable energy products.

Some of the indicators to be reported on are (i) # of women-owned/led companies for funding; (ii) # of retention plans for full-time and contracted female employees included in proposals and the score thereof; (iii) gender baseline assessment and gender action plan submitted by each company; and (iv) # of male and female customers reported at baseline and end of loan agreement.

The following sections comment on the implementation of these measures.

[21] The gender assessments and gender action plans for Zambian FPs are available at https://www.greenclimate.fund/countries/zambia?f[]=field_subtype:343&f[]=field_subtype:342.

b. Implementation, monitoring and reporting of gender action plans and related co-benefits

As part of the implementation of the TA component of FP080, there is a dedicated ongoing activity for the development and the implementation of gender action plans for both the MoE and REA. The tender process for sourcing the TA to perform this activity is ongoing.

ACUMEN, the IAE for FP148, reported female jobs as part of the green jobs created by GCF funding. In addition, female-led and female-centred enterprises such as WidEnergy have had access to funds, which would not have been the case if GCF funds had not been provided. ACUMEN also helped WidEnergy to perform a gender audit and develop a gender action plan whose implementation is ongoing.

Another gender result worth highlighting is that during the FP148 field visit, the two interviewed beneficiaries were women who have invested in the acquisition of SHS to financially benefit their households, including children and men and their neighbours. One of the beneficiaries highlighted the following: “Before the acquisition of the SHS, men and others would have to go to far off places to watch football, but now I have a TV set and they come to my home to watch it.” She added, “Because of the light, I can set up a shop and sell some groceries from my home. Since I have the light outside, I can set shop until 8–9 p.m. at night.” The other beneficiary stated, “I have doubled my earnings. My children can study more, and their grades have improved.”

c. Actions related to Indigenous Peoples

As of July 2023, the Government of Zambia does not recognize the presence of Indigenous Peoples in the country (International Service for Human Rights, 2023). This was confirmed by interviewees. Nevertheless, it is worth highlighting that there are some vulnerable communities in Zambia, notably low-income households in urban areas and vulnerable rural communities. Both groups are eligible for off-grid solutions (SHS and mini-grid) to have access to energy. The TA component of FP080 is working with the REA to define the conducive regulatory and policy framework that will enable those vulnerable groups to have access to energy and the development of productive use activities. Even before TA implementation, FP148 is working with some rural vulnerable groups by helping them to have access to energy. Finally, one interviewee mentioned that the bottom-of-the-pyramid rural poor need grants because they are unable to pay for electricity costs. For the GCF to reach these sets of populations, energy sector project grants must be directed to them.

d. Inclusion of GCF energy sector investments in NDC implementation plans

Zambia, in its first and second NDCs, has clearly identified the GCF as a climate finance source of funding to mobilize the investment needed to meet the country’s conditional targets. In addition, the NDA has been designated and assigned the responsibility of a “clearing house or entity” for projects to be submitted to the GCF.

In addition, the NDA mentioned that energy sector representatives, including the MoE and REA, have a seat on the national selection committee for GCF projects. Their roles are to ensure alignment of proposals with national energy policies. Furthermore, as previously mentioned, the GCF CP for Zambia is outdated and needs to be updated to reflect the country’s context, interests, challenges and opportunities.

e. Stakeholder ownership of implementation and the sustainability of results in the energy sector

For the implementation of the TA component of FP080 that involved the MoE and REA, AfDB has clearly defined specific activities for each of them. For allocated activities, each institution took the lead in sourcing the various competencies that will help with TA implementation. Although the process seems lengthy and cumbersome to national stakeholders, it serves to transfer knowledge and capacity to national institutions in Zambia. By so doing, project ownership is improved and the obtained results are sustained.

f. Inclusion of subnational stakeholders in activities

One of the activities to be implemented by the REA for the TA component of FP080 is an activity dedicated to stakeholder consultations for rural electrification sites. Subnational stakeholders, including traditional leaders, will be involved in this consultation to ensure that the project is inclusive.

In addition, it should also be mentioned that WidEnergy partners with local community leaders to select recommended people to be recruited as sales agents in the community.

7. Fostering technical innovation and deployment of diverse financial instruments in the energy sector by the GCF

a. The GCF's catalytic role in promoting innovative approaches to crowd in climate finance in energy investments to achieve climate goals

As stated earlier, GCF funds were instrumental in helping a private sector stakeholder in bidding lower and winning the bid for a 20 MW solar plant in Zambia. If it were not for national circumstances that have paused the project, the GCF investment would have been used to trigger more funds for project implementation.

b. Promoting innovative product, technology, business model, approach, and delivery mechanisms in the energy sector and/or other public finance institutions or development agencies by the GCF

The activity package to be delivered to the REA for the TA component of FP080 includes some activities that will definitely promote innovative approaches in Zambia. These activities include the following:

- Development of viable business models for off-grid mini-grids
- Development of tariffs, operational schemes and financial mechanisms for rural electrification projects
- Development of a resource mobilization strategy for the Rural Electrification Fund

Their implementation will contribute to the promotion of innovative approaches in energy access in Zambia.

8. The extent of the GCF's energy sector investment replicability and scalability with the objective to transform the market

WidEnergy was able to leverage more funds to expand its activities because it has gone through the ACUMEN (FP148) process, which helped it to set up the operations required by international investors. ACUMEN itself is currently embarking on "The Hardest to Reach Project", a new project

based on the successes of FP148. Therefore, GCF funds are catalytic in enabling replicability and scalability.

C. EMERGING LESSONS FOR THE GCF

The following emerging lessons for the GCF can be drawn from the Zambia case study:

- Project origination, development and implementation in vulnerable and fragile countries such as Zambia require sustained outreach activities targeting potential beneficiaries, technical capacity-building on GCF processes and requirements, and early project development funding.
- Zambia, as a developing country, has some peculiarities factored in energy sector project structuring, whereby development issues are intertwined with climate change imperatives. The lack of context on national circumstances, failing to take into consideration sociocultural contexts in project appraisal, and a lack of flexibility may lead to the rejection of very good project proposals that could have tangible impacts on the lives of populations if they are implemented.
- Zambia has only once used the RPSP in the energy sector. In a context where DAEs are recently accredited and the private sector has limited capacity to design and structure some good project proposals to be submitted to the GCF Board, it is necessary for the country to maximize the use of available GCF modalities such as the simplified approval process, the RPSP and the Project Preparation Facility.
- The GCF CP needs to be updated regularly to reflect national circumstances and align project preparation with energy sector needs. In addition, GCF energy sectoral guides need to be more disseminated among energy stakeholders to ensure alignment.
- Energy access challenges are significant in rural areas of sub-Saharan African countries, including in Zambia. To address these challenges, there is a need to combine tailored TA aimed at defining an enabling environment and the provision of concessional resources that will reach last-mile distribution companies.
- Gender and social inclusion in energy access projects that support women entrepreneurs and target women energy users is very effective in achieving results, promoting innovation, and ensuring sustainability and scalability.

Summary of evidence of paradigm shift dimensions

The following paradigm shift potential has been evidenced:

- There is a shift from polluting and harmful technologies to clean, affordable and safe energy technologies, thus promoting low-emission sustainable development pathways.
- Properly implemented energy access projects may trigger demand for more technologies and a virtuous cycle around energy access investments.

APPENDIX 6–1. LIST OF INTERVIEWEES

FULL NAME	FUNCTION	AFFILIATION
Francis Mpampi	National Coordinator	NDA
Akabiwa Nyambe	Economist & Sector Evaluator	NDA
Simainga Brenda	Environmental Specialist	NDA
Hedges Tembo	Chief Economy Officer	Department of Green Economy and Climate Change
Ireen Mizinga	Senior Economist	Ministry of Finance
Kabaso Kabwe	Principal Economist	Ministry of Finance
Michael M. Mulasikwanda	Assistant Director	MoE
Brian Mainza	Principal Energy Officer	MoE
Jackeline H. Musonda	Director – Strategy & Planning	REA
Eugene Chandi	Acting Senior Economic Analyst	REA
Steven Mwiinga	Senior Manager Electricity	ERB
Fidelis Kasanda	Engineer Renewable Energy	ERB
Munalula Mulonda	Senior Manager	ZANACO
Jack Musaka	Senior Credit Specialist	ZANACO
Elisabeth Ngoma Musonda	Technical Trainer	Zambia Energy and Environmental Organization
Collette Mwansa	Manager Corporate Finance	ZESCO
Daliso Njobvu	Communications & Policy Advisor	GET FiT programme
Judy Raphael	Programme Director	GET FiT programme
Longo Chellah	Associate Trading Manager	Africa GreenCo
Chisha Chisha	Business Development Manager	Africa GreenCo
Wezi Gondwe	Head of Business Development	Africa GreenCo
Lisso Matanga Simbeleko	Programme Manager	ElectriFi
Brighton Kajokoto	Manager Investment	National Pension Scheme Authority
Willy Chigoma	Manager Treasury	National Pension Scheme Authority
Timothy Kabandama	Assurance Manager	National Pension Scheme Authority
Abigail Ngosa	Investment Officer	National Pension Scheme Authority
Charlie Troughton	Director	MPEPO Power
Monba Tambele	Associate	MPEPO Power
Linda Thompson	Managing Director	MPEPO Power
Prem Jain	Chair, The United Nations Educational, Scientific and Cultural Organizati	University of Zambia

Full Name	Function	Affiliation
Liliane M. N. Chabuka	CEO	WidEnergy
Mercy Phiri	Kabwe Service Centre Officer	WidEnergy
Mike Mabboho	Sales Agent for Chikonkomene	WidEnergy
Silvia Namukanzya	Customer	WidEnergy
Beatrice Kapopo	Customer	WidEnergy
Christine Shaba	Customer	WidEnergy
Sam Jewett	ESG Insights Manager	ACUMEN
Brian Mainza	Chairman	APCZ

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

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