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Report No: PAD00250

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF

SDR 75.4 MILLION

(US\$100 MILLION EQUIVALENT)

TO THE

REPUBLIC OF MOZAMBIQUE

FOR A

GREEN ENERGY CORRIDORS PROJECT

AS PHASE 1 OF THE MULTI-PHASE PROGRAMMATIC APPROACH

WITH AN OVERALL FINANCING ENVELOPE OF
UP TO US\$600 MILLION EQUIVALENT

March 8, 2024

Energy & Extractives Global Practice
Eastern And Southern Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective February 29, 2024)

Currency Unit = Mozambique
Metical (MZN)

MZN 63.88 = US\$1

SDR 0.7532 = US\$1

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

ACEC	Africa Clean Energy Corridor
AfDB	African Development Bank
ARENE	Energy Regulatory Authority (<i>Autoridade Reguladora de Energia</i>)
ASCENT	Accelerating Sustainable and Clean Energy Access Transformation
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CCDR	Country Climate Development Report
CPF	Country Partnership Framework
DA	Designated Account
EAPP	East African Power Pool
EDM	Electricity of Mozambique (<i>Electricidade de Moçambique</i>)
EIRR	Economic Internal Rate of Return
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
EU	European Union
FCV	Fragility, Conflict, and Violence
FM	Financial Management
FSP	Financial Strengthening Plan
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GECP	Green Energy Corridors Project
GHG	Greenhouse Gas
GoM	Government of Mozambique
GRID	Green, Resilient, and Inclusive Development
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
HCB	Cahora Bassa Hydropower (<i>Hidroeléctrica de Cahora Bassa</i>)
HCI	Human Capital Index
HFO	Heavy Fuel Oil
HV	High Voltage
IFC	International Finance Corporation
IFR	Interim Financial Report
IGF	General Inspectorate of Finance (<i>Inspeção Geral das Finanças</i>)
IPF	Investment Project Financing
IPP	Independent Power Producer
IRR	Internal Rate of Return
IsDB	Islamic Development Bank
ISO	Independent System Operator
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
M&E	Monitoring and Evaluation
MAF	Financial Administration Manual (<i>Manual de Administração Financeira</i>)
MDTF	Multi-Donor Trust Fund

MEF	Ministry of Economy and Finance (<i>Ministério da Economia e Finanças</i>)
MEFA	Mozambique Energy for All
MIGA	Multilateral Investment Guarantee Agency
MIREME	Ministry of Mineral Resources and Energy (<i>Ministério de Recursos Minerais e Energia</i>)
MMTPA	Million Metric Tons Per Annum
MNHP	Mphanda Nkuwa Hydroelectric Project
MOMA	Mozambique and Malawi Transmission Interconnection
MOTRACO	Mozambique Transmission Company
MOZA	Mozambique and Zambia Transmission Interconnection
MPA	Multiphase Programmatic Approach
NDC	Nationally Determined Contribution
NPV	Net Present Value
O&M	Operation and Maintenance
PDO	Project Development Objective
PERIP	Power Efficiency and Reliability Improvement Project
PFM	Public Financial Management
PIU	Project Implementation Unit
POM	Project Operations Manual
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PP	Procurement Plan
PPSD	Project Procurement Strategy for Development
PrDO	Program Development Objective
PRG	Partial Risk Guarantee
ProEnergia	Mozambique Energy for All Project
ProEnergia+	Sustainable Energy and Broadband Access in Rural Mozambique
PROLER	Promotion of Auctions for Renewable Energies
PV	Photovoltaic
RAP	Resettlement Action Plan
RE	Renewable Energy
RETRADE	Regional Energy Transmission, Trade, and Decarbonization
RPF	Resettlement Policy Framework
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SNTE	The National Enterprise for Electricity Transmission (<i>Sociedade Nacional de Transporte de Energia</i>)
SPD	Standard Procurement Document
STEM	Science, Technology, Engineering, and Mathematics
STEP	Systematic Tracking of Exchanges in Procurement
TA	Technical Assistance
TCF	Trillion Cubic Feet
ToR	Terms of Reference
TREP	Temane Regional Electricity Project
USAID	United States Agency for International Development
WBG	World Bank Group
YPP	Young Professionals Program



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DATASHEET

BASIC INFORMATION

Project Beneficiary(ies) Mozambique	Operation Name Green Energy Corridors Project		
Operation ID P179797	Financing Instrument Investment Project Financing (IPF)	Environmental and Social Risk Classification Substantial	

Financing & Implementation Modalities

<input checked="" type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input checked="" type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternative Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date 28-Mar-2024	Expected Closing Date 30-Jun-2030	Expected Program Closing Date 30-Jun-2033
Bank/IFC Collaboration Yes	Joint Level Complementary or Interdependent project requiring active coordination	

MPA Program Development Objective

Strengthen the electricity network, increase regional power trade, improve sector governance, and enable renewable electricity generation through private sector participation.

MPA FINANCING DATA (US\$, Millions)



MPA Program Financing Envelope	1,553.57
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Components

Component Name	Cost (US\$)
Component 1: Strengthen transmission infrastructure	115,570,000.00
Component 2: Enable renewable energy at scale	10,000,000.00
Component 3: Improve sector governance	10,000,000.00

Organizations

Borrower:	Republic of Mozambique
Implementing Agency:	Electricidade de Moçambique (EDM), Ministry of Mineral Resources and Energy (MIREME)

MPA FINANCING DETAILS (US\$, Millions)

MPA Financing Envelope:	1,553.57
of which Bank Financing (IBRD):	0.00
of which Bank Financing (IDA):	600.00
of which Other Financing sources:	953.57

PROJECT FINANCING DATA (US\$, Millions)**Maximizing Finance for Development**

Is this an MFD-Enabling Project (MFD-EP)?	Yes
Is this project Private Capital Enabling (PCE)?	Yes

SUMMARY

Total Operation Cost	135.57
Total Financing	135.57
of which IBRD/IDA	100.00
Financing Gap	0.00



DETAILS

World Bank Group Financing

International Development Association (IDA)	100.00
IDA Grant	100.00

Non-World Bank Group Financing

Counterpart Funding	2.32
Borrower/Recipient	2.32
Other Sources	33.25
African Development Bank	33.25

IDA Resources (US\$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
National Performance-Based Allocations (PBA)	0.00	100.00	0.00	0.00	100.00
Total	0.00	100.00	0.00	0.00	100.00

Expected Disbursements (US\$, Millions)

WB Fiscal Year	2024	2025	2026	2027	2028	2029	2030
Annual	0.00	10.00	30.00	30.00	15.00	8.00	7.00
Cumulative	0.00	10.00	40.00	70.00	85.00	93.00	100.00

PRACTICE AREA(S)

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas



CLIMATE

Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● Substantial
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Substantial
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Moderate
6. Fiduciary Financial Management Risk rating from Specialist: ● Substantial as of 04-Mar-2024 Procurement Risk rating from Specialist: ● Substantial as of 06-Mar-2024	● Substantial
7. Environment and Social Environment Risk rating from Specialist: ● Substantial as of 26-Feb-2024 Social Risk rating from Specialist: ● Substantial as of 26-Feb-2024	● Substantial
8. Stakeholders	● Moderate
9. Overall	● Substantial
Overall MPA Program Risk	● Substantial

POLICY COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

Yes No

Does the project require any waivers of Bank policies?

Yes No



Have these been approved by Bank management?

Yes No

Is approval for any policy waiver sought from the Board?

Yes No

ENVIRONMENTAL AND SOCIAL

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank’s due diligence assessment of the Project’s potential environmental and social risks and impacts, please refer to the Project’s Appraisal Environmental and Social Review Summary (ESRS).

LEGAL

Legal Covenants

Sections and Description

Schedule 2. Section I. C.1. The Recipient, not later than 30 days after the Effective Date shall prepare a Project Operations Manual acceptable to the Association, and thereafter shall and shall cause EDM and MIREME, to carry out the Project in accordance with the Project Operations Manual.

Schedule 2. Section I. A. (d). The Recipient, not later than 30 days after the Effective Date shall maintain, throughout the implementation of the Project, a steering committee (“Project Steering Committee”), chaired by MIREME with composition, mandate, and resources satisfactory to the Association and detailed in the Project Operations Manual .



Schedule 2. Section I. E.3. If 60 days prior to the Closing Date, the Bank determines that there are measures and actions specified in the ESCP which will not be completed by the Closing Date, the Borrower shall: (a) not later than 30 days before the Closing Date, prepare and present to the Bank, an action plan satisfactory to the Bank on the outstanding measures and actions, including a timetable and budget allocation for such measures and actions (which action plan shall be deemed to be considered an amendment of the ESCP); and (b) thereafter, carry out said action plan in accordance with its terms and in a manner acceptable to the Bank.

Conditions

Type	Citation	Description	Financing Source
Effectiveness	Article V. 5.01	The Subsidiary Agreement between the Recipient and EDM has been executed in accordance with terms and conditions satisfactory to the Association.	IBRD/IDA



I. STRATEGIC CONTEXT

A. Country Context

- Mozambique is endowed with rich natural resources but faces substantial development challenges, including widespread poverty and inequality, limited job creation and slow structural transformation.** Three-quarters of the population live in poverty and Mozambique is one of the most unequal countries in Sub-Saharan Africa - partly reflecting low and uneven human and physical capital accumulation. Over half a million people enter the labor force each year, but less than 30,000 new formal jobs are created annually. The country is endowed with ample arable land, water, energy, mineral resources, and offshore natural gas. The private sector could become an engine of economic transformation and job creation, but it has been hampered by regulatory bottlenecks, a large infrastructure deficit, and the high cost of credit. Despite the geographic and resource advantages, Mozambique is also highly prone to natural disasters and climate risks such as cyclones, flooding, extreme heat, earthquakes, tsunamis, and water scarcity.
- Mozambique's economic growth was briefly stalled due to the hidden debt crisis, natural disasters, and the COVID-19 pandemic, but economic recovery has resumed.** Following the hidden debt crisis in 2016 during which undisclosed government-guaranteed debts amounting to US\$2 billion led to a crisis of economic governance, real Gross Domestic Product (GDP) growth reached 3.3 percent for 2016-2019, barely above population growth. Natural disasters in 2019, including Cyclones Idai and Kenneth, and the COVID-19 pandemic further pushed real per capita GDP growth down to -1.2 percent for 2020.¹ Economic growth has picked up momentum, supported by strong services and liquified natural gas (LNG) production. After a modest recovery in 2021, growth gathered pace in 2022, reaching 4.2 percent, and accelerated to 5.0 percent in 2023².
- Economic growth and poverty reduction are jeopardized by a six-year armed insurgency in the gas-rich northern province of Cabo Delgado.** Although the conflict somewhat stabilized in 2021, in part due to the intervention of South African Development Community (SADC)³ and Rwandan forces to support the Mozambican military, there has been a spike in attacks since late 2023 – including into southern Cabo Delgado - that threatens to further set back development gains and trigger a new wave of displacement. The conflict has resulted in over 4,500 fatalities and has displaced around 550,000 people – down from a peak of 1.2 million. Over 600,000 people have since returned to their places of origin. The humanitarian situation remains critical, with around two million people in the three northern provinces of Niassa, Cabo Delgado, and Nampula in need of basic assistance.
- The Government's capacity to finance development is heavily constrained.** With 70 percent of tax revenues in 2021-2022 absorbed by the wage bill and debt-service costs, the country can only allocate limited resources to public investment and social spending. Mozambique is at high risk of debt distress, with the country lacking access to the international capital markets, and external concessional financing remaining limited. Although total public debt has declined in recent years, domestic debt has continued to rise. Elevated domestic debt reflects spending by the Government to address the security and humanitarian situation in Cabo Delgado, short-term financing needs of underperforming state-owned enterprises, and debt service.
- Mozambique is expected to become a global gas player, as large natural gas reserves were discovered in the early 2010s.** The country is estimated to have 100 trillion cubic feet (tcf) of gas—the third-largest gas reserves in Sub-

¹ World Bank Mozambique Country Economic Memorandum: Reigniting Growth for All (2022).

² World Bank Macro Poverty Outlook (2024).

³ The SADC was established in 1992. The SADC member countries are Angola, Botswana, Comoros, the Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Eswatini, United Republic of Tanzania, Zambia, and Zimbabwe (<https://www.sadc.int>).



Saharan Africa after Nigeria and Algeria.⁴ In November 2022, Mozambique passed a major milestone when it began exporting LNG from the Coral South Floating LNG facility. In addition, two larger-scale onshore LNG projects could be developed, the TotalEnergies-operated Mozambique LNG, and the ExxonMobil-operated Rovuma LNG (15.2 million metric tons per annum, [mtpa]). To put this capacity in context, the global LNG trade was about 380 mtpa in 2021, with Mozambique's existing and proposed capacity of 32 mtpa roughly accounting for 8 percent of the global market. Large-scale LNG production in the second half of the decade is expected to boost growth and fiscal revenue for Mozambique. However, the armed insurgency has also affected gas development – in April 2021, TotalEnergies declared force majeure and suspended operations on its Cabo Delgado Province LNG project, withdrawing all personnel from the site due to attacks by insurgents. After a slowdown in insurgent activity, TotalEnergies plans to resume operations in mid-2024, yet security concerns remain.

6. **Medium-term growth prospects are positive, with the economy projected to grow at an average of 5 percent over the medium-term, driven by growth in the extractives sector.**⁵ LNG production is expected to rise as the offshore LNG project reaches full capacity from 2023. Increased commodity prices—notably coal and aluminum—will continue to support export growth, and Foreign Direct Investment (FDI) inflows (mainly linked to LNG) will sustain investments. These trends will be reinforced by the expected resumption of the larger LNG projects. However, risks are tilted to the downside in the medium term. Delays in the larger LNG projects could undermine growth prospects. Other risks stem from rising wage bill, climatic shocks, waning commitment to reforms in the run-up to the elections, and uncertainty around the security situation in the north.

Regional Context

7. **Electricity demand in the Southern African Power Pool (SAPP) is expected to double by 2040, driven by expansion of electricity access and growth in economic activities in the region.** The SAPP was established in 1995 to integrate the power systems of 12 non-island countries in Southern Africa. It is now the most advanced power pool in Africa in terms of volume of energy trade and market structure. As of 2021, the average access to electricity in the SADC countries was about 46 percent, ranging from less than 20 percent in Malawi and the Democratic Republic of Congo to about 90 percent in South Africa.⁶ Expectations of an accelerated increase in energy access coupled with economic growth indicate that the regional peak electricity demand is estimated to increase from about 50 GW in 2021 to over 110 GW in 2040, corresponding to an increase in generation from about 300 TWh to 700 TWh.⁷ In recent years, supply issues, particularly in South Africa, have resulted in rapidly widening demand-supply gap in the SAPP, with profound economic implications and limiting the progress toward universal access to electricity. In 2020, the supply and demand shortfall in SAPP member countries was 2,000 MW, increasing to an estimated 10,000 MW in 2023.

8. **Mozambique is already a major electricity exporter in the SAPP and building key domestic transmission segments could further integrate its power system with the SAPP.** Mozambique exports over 60 percent of its electricity to South Africa from the 2,075 MW Cahora Bassa hydropower station (*Hidroeléctrica de Cahora Bassa*, HCB)⁸ in the Tete region, through a long-term contract between HCB and Eskom (1,330 MW of HCB's total capacity is committed to Eskom under a long-term power purchase agreement [PPA] that ends in 2029). It also exports electricity through short-term bilateral contracts with seven countries and through the SAPP day-ahead market. In 2021 and 2022, Mozambique

⁴ United States, Energy Information Administration, Natural Gas data for Mozambique (2021).

⁵ World Bank Macro Poverty Outlook (2024).

⁶ World Bank estimates.

⁷ Based on the SAPP Pool Plan of 2017. An updated SAPP masterplan is expected to be available by early 2024.

⁸ The Hidroeléctrica de Cahora Bassa (HCB) operates the 2,075 MW Cahora Bassa power plant and the associated transmission system of which 300 MW firm capacity and 350 MW flexible capacity is dedicated for domestic supply and the balance is for exports.



accounted for 73 percent of the exports to the SAPP's day-ahead market.⁹ While additional interconnectors are planned, the existing segments within the Mozambique transmission network feeding into the interconnection points are congested and need to be strengthened to fully unlock the regional electricity trade potential of the proposed interconnectors. As part of the SAPP transmission backbone, a 400kV transmission line between Mozambique and Malawi (MOMA) is under construction and another 400kV transmission line between Mozambique and Zambia (MOZA) is planned, both via Matambo. However, the existing 220 kV line connecting the Songo substation of HCB to Matambo, and the capacity of the Matambo substation, are insufficient to evacuate power at scale from HCB or from future renewable power plants in the region. The Songo-Matambo transmission segment requires strengthening to enable increased domestic supply and power trade through the interconnection points. Separately, a 400kV transmission line connecting Mozambique and Tanzania (MOTA) is also proposed, which will require as a precondition a 400kV transmission line between Alto Molocue and Palma.

9. **Investment in Mozambique's electricity generation and transmission systems can play a crucial role in meeting electricity demand in the SAPP region while lowering the carbon footprint of the region's power system and reducing investment requirements in other SAPP member countries.** Analysis conducted for the Country Climate Development Report (CCDR) for Mozambique¹⁰ in 2023 demonstrated that full regional integration of Mozambique's power system with the SAPP members can reduce power system emissions in the region by 7 percent. Complementing regional integration with higher investments in Mozambique, including strengthening of the domestic transmission system to evacuate Mozambique's renewable electricity resources (particularly hydropower), will substantially reduce total decarbonization investment needs in the SAPP. For instance, to achieve 80 percent emission reduction in power generation in the SAPP by 2040, investing US\$8 billion more in Mozambique's electricity generation base in a scenario of full regional integration will reduce the overall investment requirements in the SAPP by US\$42 billion compared to a scenario with limited regional integration (that is, business-as-usual).

B. Sectoral and Institutional Context

10. **The legislative and institutional structure of the power sector in Mozambique has substantially evolved with the recent revision of the Electricity Law in 2022 mapping out the future structure of the sector.** The Ministry of Mineral Resources and Energy (*Ministério dos Recursos Minerais e Energia*, MIREME) spearheads development of the sector acting as the Government agency responsible for energy policy and planning. The national electricity utility, Electricity of Mozambique (*Electricidade de Moçambique*, EDM), is a state-owned, vertically integrated power utility in charge of electricity generation, transmission, and distribution countrywide. The Energy Regulatory Authority (*Autoridade Reguladora de Energia*, ARENE) was established in May 2017 to provide regulatory oversight of the sector. The Mozambique Transmission Company (MOTRACO), founded in 1998, is a joint venture of the three national electricity utilities of Mozambique, South Africa and Eswatini, established to operate transmission lines linking the three countries and supplying the aluminum smelter MOZAL in Mozambique. The National Enterprise for Electricity Transmission (*The Sociedade Nacional de Transporte de Energia*, SNTE) is a wholly owned subsidiary of EDM, created in 2020, to build, own and operate the 400 kV backbone transmission infrastructure connecting the northern and southern transmission segments. The private sector's participation in power generation has materialized through independent power producers (IPPs) with PPAs with EDM.¹¹ The new Electricity Law of 2022 highlights the needs for a strong Independent System

⁹ Electricity trade data from the SAPP.

¹⁰ World Bank Group. Mozambique - Country Climate and Development Report (English). Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/099113023154021937/P1771520fcab7a0930aca102c9d7107d4cc>

¹¹ 170 MW gas-fired Central Térmica de Ressano Garcia (CTRG) plant, 2014; the 120 MW gas-fired Gigawatt Power Plant in Ressano Garcia, 2015; the 40 MW Kuvaninga gas-fired power plant in Gaza Province, 2017; the 40 MW Mocuba PV plant in Zambezia Province, 2019; and the 100 MW Karpower HFO plant, 2018.



Operator (ISO). The law emphasizes achieving universal provision of quality and reliable electricity. The law also strengthens ARENE's role in public procurement of power generation and in electricity tariff setting.

11. **Mozambique is fast expanding its electricity access, but additional investments are required along the electricity supply chain to achieve universal access by 2030 and support economic growth.** In 2018, the Government of Mozambique (GoM) launched the landmark National Electricity Program for All (*Programa Nacional de Energia para Todos*) aiming to provide electricity to all Mozambicans by 2030. This high-level commitment supported a rapid increase in electricity access from 26 percent in 2018 to 47.6 percent in 2023, comparable to the Sub-Saharan African average of 42 percent. Off-grid electricity access stands at 7.1 percent accounting for a total access rate of 54.7 percent in 2023.¹² Yet access is particularly low in the high population regions in the north and center of the country. The rate of electrification has increased substantially in recent years, with over 382,000 connections made in 2023, 9 percent higher the annual target of 350,000. But at 350,000 connections per year, it is estimated that Mozambique will only reach about 65 percent grid electricity access by 2030. Achieving full grid electrification by 2030 will require a rapid scale-up of the connection rate, which could be supported under the World Bank's Accelerating Sustainable and Clean Energy Access Transformation (ASCENT, P180547) Program that aims to provide last mile connectivity to 100 million people in Eastern and Southern Africa by 2030. Yet upstream bottlenecks in transmission network and lack of affordable renewable capacity addition in the north could hamper the delivery of sustainable and affordable electricity to newly electrified areas.

12. **Mozambique lacks an integrated transmission network, limiting supply of domestic hydropower to distant demand centers and raising reliability challenges.** Mozambique's power system has developed as three separate subsystems: northern, central, and southern. The connection between the central and northern subsystems is currently through an over-constrained 220kV line between Chimuara and Nampula, and the southern subsystem is not connected with the other two at all. The center-north connection is expected to be strengthened by a new 400kV line from Chimuara to Palma via Alto Molocue and Namialo, with the section between Chimuara and Alto Molocue already under construction. Separately, a 400kV transmission line is under construction between Vilanculos and Maputo (about 500km) in the south, supported by the World Bank's Temane Regional Electricity Project (TREP; P160427).¹³ A second phase, currently without committed financing, is planned to extend the backbone northward, from Vilanculos to Matambo via Inchope (about 720 km), integrating the central and southern subsystems. Due to the existing network gaps, electricity produced at the country's main generation plant, HCB (in the north), cannot reach the southern areas through the domestic network – it must be transmitted via South Africa –and can only partially meet the demand in northern areas due to network constraints.

13. **Mozambique has multiple transmission facility owners and dispersed system operation functions.** The transmission facility owners include HCB, EDM, MOTRACO, and in the future, SNTE. Frequency regulation in the northern and central subsystems is carried out by HCB and in the southern subsystem by Eskom. The physical and operational fragmentation of the transmission system poses significant constraints for efficient scale-up of the country's power transmission capabilities and limits the country's ability to meet its own demand, enable electrification, connect new renewable generation, increase exports of electricity to the SAPP, and facilitate integration of neighboring Tanzania and Malawi into the SAPP regional network.

14. **Systematic planning and adequate enabling environment can help Mozambique attract private capital for transmission investments as the network expands.** To fully leverage the benefits of competitive private sector participation in transmission, Mozambique needs to address crucial sector issues. These include developing adequate policies, regulations, and legal framework (deriving from the Electricity Law of 2022) to expand public-private partnership (PPP) in power transmission adopting competitive procurement procedures; addressing system operation constraints; implementing tariff methodology with adequate estimation and recovery of transmission network costs; preparing

¹² EDM

¹³ TREP (P160427)-Component 1 of the project includes the construction of approximately 563 km of a 400 kV, single-circuit power transmission line between Maputo and Vilanculos (near Temane).



contractual arrangements to ringfence remuneration of private transmission operators; strengthening financial sustainability of EDM as an off-taker, and so on.¹⁴ Such reforms could enable significant private sector participation in power transmission. Yet due to low affordability levels, concessional financing of transmission investments will remain crucial to soften the tariff impact of commercial capital deployed toward transmission lines serving domestic consumers.

15. **Mozambique has significantly expanded the electricity generation base, with an increasingly important role for private investments.** Since 2014, Mozambique has added about 600 MW in installed generation capacity, with nearly 500 MW commissioned as IPPs. Mozambique's current installed capacity is around 2.8 GW while the peak domestic demand stands at just over 1 GW. IPPs currently cover about 18 percent of generation, with another IPP of 450 MW, the Temane gas to power plant, under construction. Mozambique's current generation capacity comprises 76 percent hydropower, 18 percent gas, and 6 percent solar.¹⁵

16. **The Government of Mozambique has multiple ongoing initiatives for relatively small-scale renewable energy (RE) power plants through which competitive procurement has helped realize notable reductions in power purchase tariffs.** These include the Promotion of Auctions for Renewable Energy (PROLER) Initiative, comprising of three solar and one wind power plant, each of about 30-40 MW capacity, the Global Energy Transfer Feed in Tariff (GETFIT) Program, with multiple solar and hydro sites of about 4-15 MW capacity each, and the International Finance Corporation (IFC) Scaling Solar Program toward four solar photovoltaic (PV) plants with a total capacity of 50 MW. These programs feature in the priority list of EDM's until 2030, which notably does not include any solar or wind power plants above 30 MW despite tremendous resource potential. These programs are implemented by ARENE in coordination with MIREME and EDM. Before these programs, Mozambique had commissioned the 40 MW Mocuba solar IPP in 2019 and the 40 MW Metoro solar IPP in 2022. The power purchase tariffs for the renewable IPPs have steadily declined, from a US\$0.13 per kWh for Metoro solar in 2020 to about US\$0.05 per kWh for recent solar auctions under PROLER in 2022. Yet none of the PROLER projects have achieved financial closure due to multiple sector challenges such as lack of in-house transaction advisory capacity at ARENE (resulting in intermittent transaction advisory by external consultants), regulatory issues (for example, requirement of local arbitration), inadequate risk mitigation for private sector investments via guarantees, incomplete implementation of end-consumer tariff reforms, and off-taker risks due to EDM's continued challenges (particularly backlog of arrears to IPPs, high operational losses, and exposure to foreign exchange risks).

17. **Large-scale competitive procurement of renewable power in Mozambique is limited due to an incomplete policy and regulatory framework and transmission network constraints.** The competitive procurement of renewable power developers has so far been informed by the relevant sections of the Electricity Law (1997 and 2022), the PPP Law (2011), and the Decree on PPP Regulation (2013). Yet there is a lack of regulatory guidelines for large-scale competitive procurement of RE, deriving from these existing laws, which still opens the door for non-competitive procurement as exceptions. RE projects are also limited due to transmission constraints and low capacity of aggregator substations in the renewable resource rich areas of the country. Inadequate network capacity and expected impact of recently procured solar power plants on grid stability has increased the realized cost of these projects and is limiting Mozambique's ability to develop larger scale plants. These constraints are limiting the development of RE to small capacity RE plants, preventing Mozambique from realizing economies of scale and achieving cost-reductions observed globally.

18. **Mozambique has the potential to become a renewable energy powerhouse within the Southern Africa region and accelerate access to electricity through low-cost and low-carbon energy for the people in Mozambique and the region.** The country is endowed with large untapped hydropower, solar and wind potential in various regions that far exceed projected domestic demand. The Renewable Energy Atlas of Mozambique put the estimates for hydro, solar, and wind energy potential at 5.6 GW, 18.6 GW, and 23,000 GW, respectively. Mozambique's Energy Transition Strategy of 2023 proposes development of 1 GW of new solar PV and 200-500 MW of onshore wind capacity by 2030. Separately, a

¹⁴ World Bank Group. 2017. Linking Up: Public-Private Partnerships in Power Transmission in Africa. World Bank, Washington, DC. <http://hdl.handle.net/10986/26842> License: [CC BY 3.0 IGO](https://creativecommons.org/licenses/by/3.0/).

¹⁵ EDM



major hydropower plant, the 1,500 MW Mphanda Nkuwa Hydroelectric Project (MNHP), is planned for development on the Zambezi River (60 km downstream of HCB) by 2030. It is among the least-cost options in the Mozambique Power System Development Masterplan (2018-2043) and a priority project in the SAPP Regional Power Pool Plan (2017). Developing such resources at scale requires larger aggregated demand from the regional market and adequate domestic transmission infrastructure integrated in the SAPP. Such an approach will also increase export revenues to the power sector, improving the prospects for accelerating domestic access to electricity and having knock-on socioeconomic benefits.

19. **Increasing the domestic and regional supply of renewable energy from Mozambique will require sustained investments in generation and transmission systems.** The Power System Masterplan of 2018 (currently undergoing an update) estimates that by 2030, investment needs in the generation and transmission segments are up to US\$9 billion and US\$1.4 billion, respectively. These investments will be essential to accommodate increasing demand due to access expansion, strengthen electricity supply to centers of rapid economic growth in the north, and enable regional integration and dispatch of new renewable power plants. Most of the electricity currently supplied to the north comes from a heavy fuel oil (HFO) power ship off the coast of Nampula, which sells electricity to EDM at among the highest power purchase tariffs in the country and worsens the emissions intensity of power generation in Mozambique. Transmission investments that strengthen the integration of northern demand centers with renewable resources will displace HFO-based power. Without such investments in RE and associated transmission infrastructure, the increasing electricity demand in the north may continue relying on HFO or domestic gas resources.

20. **Recent power sector reforms in Mozambique have focused on improving the operational performance and recovery of financial viability of EDM.** EDM's financial situation had deteriorated alarmingly by 2018 with multiple years of net losses and accumulation of arrears to IPPs and fuel suppliers. To improve the situation, the GoM, with support of the World Bank, has been implementing a Financial Strengthening Plan (FSP) since 2020 through a set of measures, including: (i) reduction in system losses by two percent annually (ongoing), (ii) allocation of additional 200 MW capacity from the HCB towards Mozambique's demand (completed), (iii) adoption and implementation of a new tariff setting methodology (ongoing), (iv) recapitalization of EDM's debt to strengthen balance sheet (completed); and (v) ring-fencing the funding of electrification programs outside of EDM balance sheet (ongoing). Consequently, EDM's financials have improved substantially, by 2022: the operating profit margin¹⁶ had increased to 15.7 percent from -2.2 percent in 2017, driven by a growth in revenue from both domestic sales and exports. System losses were reduced by 3.1 percentage points between 2021 and 2022, and about 1.04 million new customers were added from 2021 to 2023 (3.33 million customers in total). EDM has also reduced arrears to key IPPs from US\$192 million in 2020 to US\$161 million in 2022. Yet sustained efforts are required to continue the operational improvements. For instance, system losses remain 26 percent as of 2024, causing significant inefficiencies, damaging EDM's finances and potentially burdening end consumer tariffs.

21. **The pace of reform needs to be sustained and aligned with the pace of the power sector growth.** The Electricity Law of 2022 highlights the creation of new institutions and leaves open the sector structure to future decisions by the Council of Ministers regarding competition. With very few operating agents in the sector, and low level of access, wholesale competition is not likely to be viable in the short-term, and it will take several years to establish enabling conditions. However, transmission system is expected to evolve rapidly with the incorporation of new private generators. Necessary reforms include ensuring independent economic dispatch of generation, systematic least cost generation and transmission expansion planning and timely implementation of identified investments in both segments. While legally unbundling transmission from other segments in the supply chain is the standard best practice to incorporate wholesale competition, it is important to first implement other actions compatible with the initial stages of sector evolution. The reforms may eventually lead to the establishment of an ISO, which subsequently transitions to a Market Operator once wholesale competition is introduced.

¹⁶ Measured as Earnings Before Interest, Taxes and Depreciation (EBITDA)



C. Relevance to Higher Level Objectives

22. **The proposed program is aligned with the World Bank Group’s Mozambique Country Partnership Framework (CPF) for FY2023-27 discussed by the Board on February 23, 2023 (Report N°176672), which has the overarching goal to support Mozambique’s progress toward green, resilient, and inclusive development (GRID).** The proposed program aims to develop climate resilient transmission infrastructure to evacuate renewable energy from Mozambique for domestic and SAPP demand, improve stability and reliability of Mozambique’s electricity supply, and support development of renewable energy at scale, all of which are aligned with the GRID approach of the CPF. The proposed program will directly support CPF Objective 4 on enabling green growth through sustainable use of natural resources and Objective 6 on expanding infrastructure services.

23. **The proposed program is aligned with the World Bank’s Evolution priorities, its mission to end extreme poverty and boost prosperity on a livable planet and the regional priorities of Southern and Eastern Africa.** The project directly addresses the World Bank’s new mission and vision by promoting climate change mitigation and adaptation, and by supporting additional electricity consumption particularly in fragile and conflict areas in northern Mozambique. The program will also finance development of the necessary upstream generation and transmission infrastructure to complement last mile connectivity that will be supported under the Mozambique phase of the ASCENT MPA (P180547).

24. **The program will promote Maximizing Finance for Development (MFD) and Private Capital Enabling (PCE) under the One World Bank approach while supporting the regional objectives of the SAPP.** The first phase of the program aims to develop an enabling framework for private sector participation in large scale RE projects. The program will integrate the standardized methodology under the Sustainable Renewables Risk Mitigation Initiative (SRMI) to support Mozambique in designing and implementing RE programs to attract private investments. The program will be implemented in close coordination with the IFC and the Multilateral Investment Guarantee Agency (MIGA) and will identify joint approaches to unlock private capital. IFC is already implementing the Scaling Solar program in Mozambique and both IFC and MIGA have provided support to the Temane Gas to Power Plant along with World Bank payment guarantees. The program also envisages development of selected power transmission lines as PPP, with technical assistance (TA) and sector reforms under Phase-1 of the MPA paving the way for PPP in subsequent phases. The program will also support the SAPP objectives on promoting cooperation in the regional electricity planning and operation, facilitating regional trade, and increasing access to electricity in rural areas.

25. **The program is consistent with the World Bank’s Climate Change Action Plan (CCAP) 2021-2025, and with Mozambique’s Nationally Determined Contribution (NDC) commitments of improving access to RE, promoting expansion of the national grid, increasing the share of RE in the generation mix, and building resilience in power infrastructure.**¹⁷ The proposed program is designed to accelerate energy transition in the Southern Africa region by improving the integration of Mozambique’s power system within the region and catalyzing development of renewable energy capacity in Mozambique. The investments to be supported by the program are aligned with the CCDR for Mozambique. There are no climate mitigation risks since the program will enable the country to increase the share of low greenhouse gas (GHG) emission sources in its electricity generation mix. The program considers adaptation and resilience climate risks.

26. **The program is aligned with the new World Bank Group Gender strategy (FY24-30).** The program will contribute to the narrowing of gender gaps by elevating human capital and incorporating measures to mitigate gender-based violence in project activities; creating, expanding, and enabling opportunities for inclusive economic participation through women’s employment in the energy sector; increasing productivity of women-led enterprises; and creating opportunities to engage women as leaders in the energy sector.

¹⁷ Mozambique’s updated NDC (2021) also commits to reducing emissions by about 40 million tCO₂e between 2020 and 2025.



D. Multiphase Programmatic Approach (MPA)

(i) Rationale for using the MPA

27. **The MPA will enable sustained efforts needed towards the medium-term objective of developing Mozambique as a regional energy hub and achieving universal electricity access, while continuing sector reform and modernization.** The MPA will provide the GoM with a long-term commitment from the World Bank toward tying together the different pieces of its domestic and regional energy sector strategy. The commitment is particularly crucial to support the evolution of Mozambique's transmission system for its fundamental role in supporting access expansion in Mozambique, and in regional integration and decarbonization in the SAPP. The MPA will help mobilize adequate financing at various stages of the evolution of the Mozambican power system, and scale-up deployment of its RE resources toward regional decarbonization. Structuring the MPA phases simultaneously will enable seamless deployment of financing across the different stages of this transition.

28. **The MPA will address crucial roadblocks toward achieving the Sustainable Development Goal (SDG) 7 objective of universal electricity access in Mozambique – the MPA will finance upstream transmission and RE generation investments, and support sector reforms, complementing last mile connectivity investments under the ASCENT MPA in a programmatic manner.** The World Bank approved the ASCENT program in November 2023, with an overall financing envelope of US\$5 billion, to significantly step-up investments in last mile access expansion. The ASCENT MPA aims to provide electricity access to 100 million people in Eastern and Southern Africa by 2030, including in Mozambique, which is expected to be a part of the second phase of ASCENT. Yet Mozambique is already facing upstream bottlenecks in transmitting sufficient clean energy to newly connected areas in the north. Timely reforms are also necessary to ensure the evolution of the sector in pace with its expansion towards universal access. As ASCENT will have a multiplier effect on last mile connectivity, it will require adequate complementary financing to build upstream transmission lines and RE generation plants to provide affordable, reliable, and clean energy to newly electrified areas. Financing upstream investments in a programmatic manner will help adapt future MPA phases to the evolving needs of downstream access expansion.

29. **The MPA will help put together the interlocking building blocks required to advance the green energy transition in Mozambique in a sustained, programmatic manner.** While Mozambique has plans for ambitious power sector projects and has attracted significant interest in its competitive RE programs, interconnected sector challenges limit the scale of such programs. The MPA will provide sustained, long-term, sequential support towards the sector-wide reform, investment, and capacity building efforts needed to accelerate Mozambique's energy transition. Upfront clarity on sequential development of crucial transmission segments via a long-term program will unlock significant renewable development capacity in the network areas and encourage development of trans-border links. Identifying key risks towards attracting private sector participation in generation and transmission in the first phase of the program will enable deployment of specific risk mitigation measures in the subsequent phases and help leverage much-needed private capital to meet sector investment needs. Finally, upfront commitment towards the evolution of the sector's institutional structure and deploying technical assistance and investments for such evolution in a programmatic manner, will consistently improve the enabling environment for private sector participation. A programmatic approach will offer the vision, consistency, adaptability, and financing required to implement this multi-step agenda, unlocking Mozambique's potential as a green energy hub in the SAPP.

30. **A sequence of projects, as an alternative to the MPA approach, will neither provide the long-term commitment necessary to support the large-scale transition envisioned for Mozambique's power sector nor the agility to adjust the building blocks of the transition as the sector evolves.** Mozambique's power sector is at a critical juncture in its transformation and will require, in the coming decade, concessional and private financing for expanding and integrating its transmission network, supporting the creation of an enabling environment for development of large and complex renewable energy projects, de-risking and leveraging private investments through incremental TA and provision of guarantees, and improving system operation and sector operational and financial performance to keep pace with the

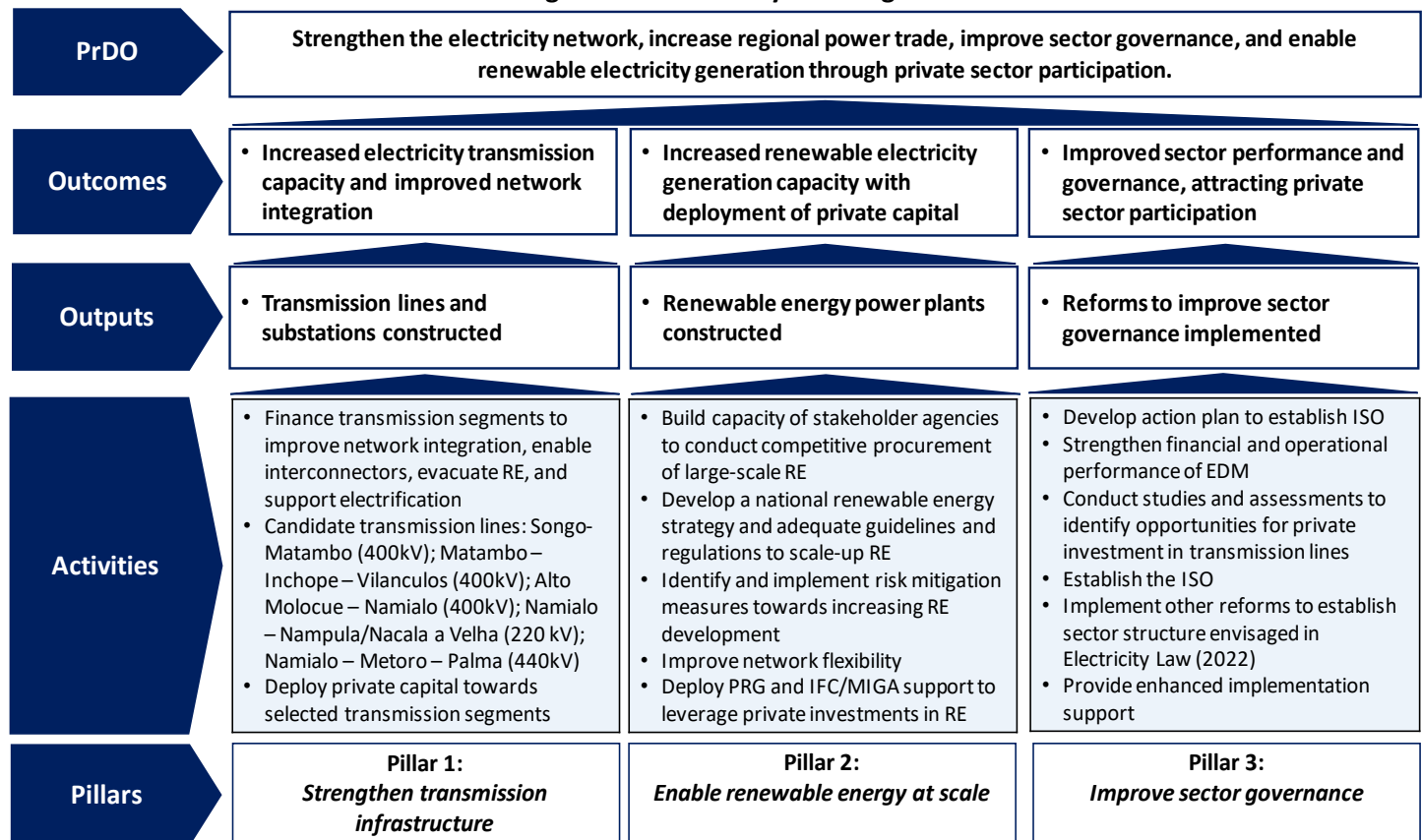


increase in size, complexity, and regional integration of the power sector. Individual projects are less suitable for providing adequate commitment to support such long-term development plan and vision around which support of the World Bank and other stakeholders would coalesce. An MPA with simultaneous phases will confirm upfront financing commitment towards this transition, give clear signal to other stakeholders (particularly the private sector) on the World Bank’s commitment to the evolution of Mozambique’s power sector, and create a framework to advance energy transition in Mozambique and the SAPP.

(ii) Program Results Chain

31. **GECP will be structured as a simultaneous vertical MPA which will comprise of three phases and build on three pillars, namely: (a) strengthen transmission network and interconnections; (b) enable RE at scale and (c) improve sector governance.** Under Pillar 1, the bulk of GECP’s financing will be deployed towards developing Mozambique’s transmission infrastructure with the objectives of increasing domestic and regional supply of renewable energy, increasing electricity supply to newly electrified areas, and improving network integration and reliability. Pillar 2 will complement this by advancing development of RE at scale in Mozambique, beginning with TA and subsequently through deployment of public financing (as partial risk guarantees [PRG] and other suitable WBG instruments) to mobilize private capital. Finally, under Pillar 3 investments in the transmission network and expanding RE will be underpinned by sector reforms. The program theory of change is presented in Figure 1.

Figure 1: MPA Theory of Change





(iii) Program Development Objective and Key Program DO Indicators and Baseline Targets

32. The Program Development Objective (PrDO) of the MPA is to strengthen the electricity network, increase regional power trade, improve sector governance, and enable renewable electricity generation through private sector participation.

33. The PrDO level indicators are shown in Table 1:

Table 1: PrDO Level Indicators

Outcome	Indicator	Target
Strengthen the electricity network	Additional transmission hosting capacity enabled (MW)	1500
Increase regional power trade	Additional electricity trade capacity enabled between Mozambique and the SAPP members (MW)	150
Improve sector governance	Independent System Operator (ISO) established (Yes/No)	Yes
Enable renewable electricity generation through private sector participation	Increased renewable electricity generation capacity (MW)	400
	Private and commercial capital mobilized (US\$ million)	600

(iv) Program Framework

34. **The MPA phases, each to be structured as investment project financing (IPF), are designed to strengthen and expand Mozambique’s power transmission system and its regional integration, accelerate development of Mozambique’s RE resources, and support sector reforms in tandem with sector expansion.** The MPA will comprise of three pillars to implement these objectives through three phases (Table 2). Pillar 1 will support transmission investments in Mozambique that will achieve multiple objectives: improving network integration and reliability, evacuating RE, enhancing regional integration and supporting electrification, particularly in fragility, conflict and violence (FCV) affected areas in the north (Table 3, also see Annex 3 for a map of proposed transmission investments). The phasing of the lines is based on sequential network extension (e.g., Songo-Matambo in Phase-1 followed by Matambo – Inchope and Inchope – Vilanculos in subsequent phases) and readiness of feasibility studies (FS) and environmental and social impact assessments (ESIAs). While the transmission line in Phase-1 will receive full concessional financing, private sector participation will be explored for transmission lines under Phases 2 and 3. An MPA will offer long-term commitment to complete the integration of central and southern subsystems and strengthen the link between central and northern subsystems. Pillar 2 will start with developing the regulatory framework and providing TA for competitive procurement of RE projects and it will advance in subsequent phases by providing PRG, alongside appropriate MIGA and IFC instruments, to RE projects that will be developed sequentially in the RE program. Pillar 3 will support sector operational and institutional reforms by continuing the operational reform agenda currently supported by other projects and implementing a sector institutional improvement roadmap.

35. **The MPA will complement the Regional Energy Transmission, Trade and Decarbonization (RETRADE) MPA (P175190), currently under preparation, by building transmission segments that are a precondition for enhanced regional integration.** The RETRADE MPA, a regional program, is expected to finance priority cross-border transmission segments in southern Africa to improve regional integration and enhance electricity trade. These could include the remaining links between Mozambique and its neighbors, particularly Tanzania (MOTA) and Zambia (MOZA). The combined GECP and RETRADE MPA interventions could address the deep-rooted power sector challenges in southern Africa, including limited affordable access, unreliable supply, and high carbon intensity. Strengthening regional energy integration can also boost the development of untapped renewable energy resources across the SAPP and substantially reduce GHG emissions in the region. Establishing a programmatic approach toward transmission network expansion via the GECP will allow Mozambique to develop necessary domestic transmission segments in tandem with development of cross-border links under RETRADE. RETRADE will also complement the GECP in implementing sector and market reforms among SAPP member countries to improve power trade dynamics in the SAPP. Since export revenues are crucial for the financial



sustainability of EDM, such complementarities will help mitigate risks associated with delays in interconnector projects and contractual risks, by ensuring close coordination between national and regional transmission expansion.

Table 2: MPA Components and Phases

MPA Phases/ Pillars	Phase 1	Phase 2	Phase 3
Pillar 1 Strengthen transmission infrastructure ¹⁸	<ul style="list-style-type: none"> Finance key transmission segments Songo – Cataxa – Matambo (400kV) 	<ul style="list-style-type: none"> Finance key transmission segments; potential PPP¹⁹ Matambo – Inchope (STE Phase II, 400kV); Alto Molocue – Namialo (400kV) – Nampula/Nacala (220kV) 	<ul style="list-style-type: none"> Finance key transmission segments; potential PPP Inchope – Vilanculos (STE Phase II, 400kV); Namialo - Metoro – Palma (400kV)²⁰
Pillar 2 Enable RE at Scale	<ul style="list-style-type: none"> TA towards competitive procurement of RE Development of RE strategy, regulatory guidelines, VRE integration studies 	<ul style="list-style-type: none"> Risk mitigation to leverage private investments in RE PRG and IFC/MIGA support towards RE identified for Phase-2 	<ul style="list-style-type: none"> Risk mitigation to leverage private investment in RE PRG and IFC/MIGA support towards RE identified for Phase-3
Pillar 3 Improve sector governance	<ul style="list-style-type: none"> TA towards improving sector governance Development of institutional reform roadmap; continuation of FSP 	<ul style="list-style-type: none"> TA towards improving sector governance Implementation of institutional reform roadmap, including operational support 	<ul style="list-style-type: none"> TA towards improving sector governance Establishment of ISO

36. **Phase-1 of the MPA will finance key transmission segments in Mozambique required for meeting domestic demand and enhancing SAPP regional integration, initiate core TA toward enabling RE at scale, and advance structural and operational reforms in the power sector.** Specifically, this phase will finance the Songo – Cataxa – Matambo transmission corridor, which will advance domestic network integration, enable increased evacuation of RE, and enable regional integration with Malawi and Zambia (Table 3 and Annex 3). Phase-1 of the MPA will also initiate development of large RE projects in Mozambique by providing TA towards strengthening the RE competitive procurement framework, deriving from the standardized SRMI approach. This phase will also continue supporting sector operational and financial improvements, including those constituting the ongoing FSP, and initiate efforts toward strengthening the sector institutional framework. The latter will be achieved by providing TA for enhancing sector governance, optimizing sector structure, and strengthening system operation in its roles of domestic and regional supply. TA will also be provided to support development of selected transmission lines as PPP under future phases of the MPA.

37. **Phase-2 of the MPA will continue the development of transmission segments to enable interconnectors, improve reliability and support new RE projects, expand RE capacity in Mozambique (leveraging private sector investments), and will further support improvements in sector operation and governance.** This phase could finance up to two crucial transmission segments, leveraging other concessional and private financing. These include: (i) part of the STE Phase II 400kV line between Matambo – Inchope, and (ii) Alto Molocue – Namialo 400kV line with associated 220kV extensions from Namialo to Nampula and to Nacala a Velha. These transmission segments will improve domestic network integration, enable evacuation of additional RE, and support electrification in central and northern regions. The Alto Molocue – Namialo segment will also advance Mozambique’s backbone network towards Tanzania (Table 3 and Annex 3). To enable RE at scale, Phase-2 will deploy a suite of WBG solutions, including PRG and appropriate IFC and MIGA

¹⁸ All transmission lines feature in the list of EDM’s priority transmission projects. Yet there may be adjustments in the phasing of the transmission lines depending on the prioritization in the updated Power System Master Plan, expected in 2025.

¹⁹ Depending on adequate policy and the regulatory framework and commercial viability of the selected transmission lines, the MPA envisages leveraging private financing for transmission lines to be supported in Phases 2 and 3.

²⁰ The cross-border link between Palma in Mozambique and Mtwara in Tanzania could be supported by the RETRADE MPA (P175190).



instruments, for candidate renewable power plants identified for investment through Phase-1 TA. The WBG solutions are expected to have a multiplier effect in unlocking private investments at scale in renewable energy development in Mozambique. Finally, this phase will include additional activities aimed at improving the operation and governance of Mozambique’s power system, with the objective of strengthening system dispatch and operation and enhancing regional trade. Providing PRG and other IFC/MIGA instruments, financing critical transmission and ancillary investments, and improving sector operation and governance will offer substantial risk mitigation toward leveraging private sector investment in RE in Mozambique. This phase will be designed in close collaboration with IFC and MIGA.

Table 3: Benefits, Readiness and Phasing of Transmission Lines proposed under the MPA

	Improve network integration and reliability	Evacuate RE	Regional integration	Support electrification	Readiness	MPA Phase
Songo - Cataxa - Matambo	✓	✓	✓ (MOMA and MOZA)		FS and ESIA ready	1
Matambo - Inchope (STE Phase II)	✓	✓		✓	Concept stage	2
Alto Molocue - Namialo - Nampula/Nacala a Velha	✓	✓	✓ (MOTA)	✓ (FCV)*	Outdated FS and ESIA from 2012	2
Inchope – Vilanculos (STE Phase II)	✓	✓		✓	Concept stage	3
Namialo - Metoro - Palma	✓		✓ (MOTA)	✓ (FCV)*	Concept stage	3

**These lines will transmit electricity to newly electrified areas in the north, which have been affected by violence.*

38. **Phase-3 of the MPA will finance additional transmission lines, support additional RE projects, and build on sector reforms from the previous phases to establish the institutional structure requisite for the evolved power sector in Mozambique.** This phase is expected to complete the two 400kV domestic backbones by (i) extending the STE Phase II 400kV line from Inchope to Vilanculos, and (ii) extending the central 400kV transmission line northwards from Namialo to Palma (via Metoro), enabling the MOTA interconnector (Annex 3). Other concessional and private financing will be explored for these lines. Finally, this phase will continue supporting de-risking of renewable energy development through PRG and IFC/MIGA instruments. The financing allocation for this phase will be determined at the time of processing based on the implementation progress and lessons learned in the precedent phase, availability of country IDA allocations, IDA terms, and country borrowing limits. This phase will also be designed in close collaboration with IFC and MIGA.

39. **While the private sector will drive the development of renewable energy in Mozambique, public financing is necessary to create an enabling environment and de-risk private investments.** The bulk of the investment in the project will be in transmission lines which will compound the benefits of concessional financing by fulfilling unserved demand in regions of economic growth, feeding into the new connections supported by Mozambique’s access expansion program, and enabling evacuation of renewable energy (which will be developed by the private sector). The transmission segment in Mozambique’s power sector requires additional reforms (proposed to be partially supported by the MPA) before it can reach the stage of attracting low-cost commercial financing. In the meantime, concessional public financing of transmission lines will remain crucial in ensuring the affordability of electricity services in the country, in leveraging an increase in electricity access to drive economic growth, and in enabling RE expansion.²¹ The private sector is already the key driver behind expansion of the generation segment in Mozambique, with about 500 MW capacity commissioned since 2015 and over 500 MW additional capacity in the pipeline. The MNHP and any future solar and wind power plants are also expected to be developed by the private sector. Yet public financing is essential to ensure that private investments are adequately and efficiently leveraged. Limited affordability (which is particularly sharp in Mozambique with 60 percent of

²¹ World Bank (2023). “Scaling Up to Phase Down: Financing Energy Transitions in the Power Sector.” Washington, DC: World Bank.



the population living in extreme poverty), limited access to private capital and high cost of capital are key barriers in scaling up energy transition in emerging economies.²² These barriers can be addressed by strategic deployment of concessional financing, particularly in supporting sector reforms; financing preparatory work toward RE development; and strengthening integrated planning and capacity building to mitigate the risks of investment.

Table 4: MPA Program Framework

Phase #	Project ID	Sequential or Simultaneous	Phase’s Proposed DO	IPF or PforR	Estimated IBRD /IDA Amount (US\$M)	Estimated Other Amount (US\$M) #	Estimated Approval Date	Estimated E&S Risk Rating
1	P179797	Sequential	Strengthen the electricity network and increase regional power trade.	IPF	100	36 ²³	Q3, FY24	Substantial
2			Strengthen the electricity network, increase regional power trade, improve sector governance, and enable renewable electricity generation through private sector participation.	IPF	250	568	FY26	Substantial
3			Strengthen the electricity network, increase regional power trade, improve sector governance, and enable renewable electricity generation through private sector participation.	IPF	250	350	FY28	Substantial
Financing Envelope					600	954		

The estimated other amount for Phase-1 includes potential co-financing from other development partners toward transmission lines, and for the subsequent phases it includes both concessional and private financing toward transmission investments and private investments for renewable power plants.

(v) Learning Agenda

40. The learning agenda will ensure that technical studies, assessments, and knowledge creation during the MPA adequately inform the design and implementation of subsequent phases.

- a. **Development of transmission lines:** While the program proposes a set of priority transmission lines for development, the final candidate transmission lines in future phases will be selected based on an update of the power system masterplan, which will propose least cost generation and transmission system expansion. This will be complemented with feasibility studies, network strengthening assessments, market studies, and ESIA’s, to provide details necessary for making financing decisions. Studies being supported by other development partners and proposed under the RETRADE (P175190) and ASCENT (P180547) programs on transmission interconnections and last mile connectivity will also contribute to the learning agenda for transmission system expansion.
- b. **Deployment of large-scale RE through competitive procurement:** The development of RE in Mozambique under the program is designed to build on knowledge created through dedicated TA. Phase-1 will finance studies, assessments, and capacity building across different aspects of RE development, including development of a national RE strategy, adequate policy and regulatory framework for competitive procurement, network strengthening requirements, and identification of specific risks and mitigation measures. Phase 1 may also support technical studies for specific RE projects identified in the masterplan and aligned with the RE strategy. This vast foundational work in Phase1 will pave the way for developing specific

²² Ibid.

²³ The exact amount is US\$35.57 million which includes US\$33.25 million from African Development Bank (AfDB) and contribution from the Government of Mozambique in the amount of US\$2.32 million.



RE projects in Phases 2 and 3, leveraging PRG and other WBG instruments, to attract private capital participation. Lessons learned from RE projects developed under Phase-2, and other sector studies developed during that phase (e.g., updated power system masterplan, market studies, etc.) will inform development of projects under Phase3.

- c. **Improving sector governance:** With the increased pace of power sector growth, Mozambique would need to establish necessary reforms compatible with the stages of the sector’s evolution. To this end, the first phase will support creation of an action plan and associated studies for establishment of an ISO and wider sector institutional structure as proposed in the Electricity Law of 2022. Global lessons from successful power sector evolution will be shared with the stakeholders in Mozambique and deployed as relevant. Investment needs in sector operational infrastructure (for example, towards improving system operation, dispatch, and market functions) will be identified in technical studies and may be deployed in subsequent phases. The sector reform agenda will advance by consistent knowledge creation and deployment of technical assistance and financing with the overarching aim of improving governance.

II. PROJECT DESCRIPTION

A. Project Development Objective

(i) PDO Statement

41. The Project Development Objective (PDO) is to strengthen the electricity network and increase regional power trade.

(ii) PDO Level Indicators

- i. Additional transmission hosting capacity enabled in EDM’s transmission grid (Megawatt)
- ii. Additional electricity trade capacity enabled between Mozambique and Malawi (Megawatt)

B. Project Components

Component 1: Strengthen transmission infrastructure (Total: US\$115.57 million equivalent, out of which IDA: US\$80 million equivalent, AfDB: US\$33.25 million equivalent and GOM: US\$2.32 million equivalent)

42. **This component will finance the construction of a new 400kV transmission line between Songo and Matambo, via Cataxa, and upgrades at the existing Songo and Matambo substations.** The line has been selected from a long list of priority transmission lines included in EDM’s transmission investment plan which aims to maximize renewable energy share in EDM’s energy mix and strengthen transmission infrastructure for domestic and regional supply. The investment plan is guided by analytical assessments, including the Mozambique Power System Development Masterplan (2018-2043; expected to be updated by June 2024), the grid capacity assessment for renewable energy conducted by EDM, demand assessments, and other studies. The Songo – Cataxa – Matambo line was shortlisted by applying the criteria that this segment would: (a) relieve the overloaded 220kV transmission lines between Songo and Matambo; (b) support the facilitation of regional power trade with Zambia and Malawi; and (c) evacuate locally generated renewable energy into the mix. This segment is ready for implementation, hence is being prioritized for Phase1 of the MPA, with other priority transmission segments which are at early stages of readiness being proposed for subsequent phases.

43. **Building a new 400kV transmission line between Songo and Matambo is necessary to increase renewable electricity supply in Mozambique and to the SAPP.** The existing two 220 kV transmission lines between Songo and Matambo that connect HCB with the central and northern transmission segments are highly constrained, posing several challenges: (i) they prevent evacuation of additional hydropower from the HCB for supply in Mozambique and the SAPP; (ii) they are inadequate for realizing the full benefits of the upcoming interconnections to Zambia and Malawi; (iii) they are bottlenecks in the planned 400kV Mozambique Transmission backbone from Songo to Maputo, via Matambo, Inchope and Vilanculos, as well as the 400kV central – north transmission corridor from Songo to Palma, via Matambo, Inchope,



Chimuara, Alto Molocue and Namialo. The proposed Songo – Matambo 400kV upgrade is required to evacuate additional hydropower from HCB and improve domestic and regional network integration, consequently enabling direct hydropower supply from HCB to Mozambique and to the SAPP. Furthermore, by passing through Cataxa, the proposed transmission corridor also provides the option to evacuate hydropower from the planned MNHP as well as from other renewable power plants that may be developed in the Tete region.

44. **The proposed 400 kV transmission line project will consist of a 118 km 400 kV Transmission Line from Songo substation via Cataxa to Matambo substation.** According to the preliminary design, the proposed line will have two sections: a 54 km section from Songo to Cataxa and a 64 km section from Cataxa to Matambo. This financing will also support upgrades at Songo Substation with installation of new transformers, extension of the busbar, and construction of a transformer/line bay and construction of a new 400 kV feeder bay at Matambo substation. The proposed transmission corridor will incorporate climate resilience into its design, significantly improving the climate adaptability of the power transmission infrastructure between Songo and Matambo, since the existing 220kV lines were built over 37 years ago without climate considerations. The World Bank and AfDB will finance separate procurement lots under a parallel co-financing arrangement. The component will also finance cash compensation and land purchase costs associated with the implementation of Resettlement Action Plans (RAPs) under the project.

45. **This component complements the existing energy sector engagement of the World Bank in Mozambique by meeting critical infrastructure investment needs.** The World Bank financing in the energy sector in Mozambique amounts to nearly US\$1 billion covering projects in generation, rehabilitation and upgrade of electricity transmission and distribution infrastructure as well as increasing grid and off-grid electricity access.²⁴ The project will support upstream transmission investments for both domestic demand and exports, complementing the existing portfolio by supporting increased domestic electricity consumption and regional power trade.

Component 2: Enable renewable energy at scale (US\$10 million equivalent)

46. **Mozambique requires a coordinated national program for large-scale deployment of RE to maximize the efficiency of competitive procurement and adequately leverage the de-risking potential of financing instruments.** This will require efforts on multiple fronts, including (i) setting a medium/long term vision for RE development underpinned by adequate policy and regulatory reforms to appropriately define roles and responsibilities of stakeholder agencies for competitive procurement; (ii) preparing long-term least-cost generation plans with a pipeline of RE generation projects; (iii) conducting assessments for site identification (including more granular resource assessments and pre-feasibility and feasibility studies); (iv) investing in transmission infrastructure to facilitate RE evacuation at scale while maintaining network stability; (v) evaluating the role of storage (battery as well as pumped hydro) in scaling RE; (vi) identifying of residual risks to private investment in competitive procurement of large-scale RE with adequate risk mitigation initiatives (such as payment guarantees, blended finance); and (vii) building capacity of stakeholder agencies to take a large-scale RE project from concept to commissioning. Implementing such measures will enable the GoM to implement large-scale renewable energy auction programs, leveraging private sector strengths and realizing significant cost efficiencies.

47. **Phase1 of the MPA will support MIREME and EDM implement activities, in coordination with ARENE, which sets the stage for expansion of renewable energy capacity in Mozambique in the subsequent phases, reflecting lessons learned from the Government’s ongoing RE programs.** The proposed activities and their respective implementing agencies include the following:

- a. **Subcomponent 2a. Activities implemented by MIREME (in coordination with ARENE, as needed; US\$5 million equivalent):** (i) Development of a RE strategy for Mozambique, aligned with the energy transition strategy and other sector plans and strategies; (ii) preparation of adequate guidelines and/or regulations for competitive selection of investors and contractors for RE projects; (iii) support to ARENE to close regulatory

²⁴ The respective projects are Temane Regional Electricity Project (P160427), Power Efficiency and Reliability Improvement Project (P158249), Mozambique Energy for All (P165453), and Sustainable Energy and Broadband Access in Rural Mozambique (P172595).



gaps, including on end-consumer tariffs; capacity building to develop full scale in-house transaction advisory services at ARENE; (v) identification of key risks to private investments in large-scale RE and specific risk mitigation measures; (vi) preparation of transactions (e.g., resource assessments, identification of pipeline of projects); and (vii) any required transaction advisory support (legal, technical, financial/commercial) on identified large-scale RE projects; and any other sector TA activities as identified during implementation.

- b. **Subcomponent 2b. Activities implemented by EDM (US\$5 million equivalent):** (i) capacity building to develop required transaction advisory services at EDM; (ii) preparation of transactions (e.g., pre-feasibility and feasibility studies, ESIA etc.); (iii) transaction advisory support (legal, technical, financial/commercial); (iv) identification of network connection requirements and associated strengthening of the transmission system and other infrastructure requirements (e.g., substation upgrades; installation of equipment to manage variability; access roads and other related infrastructure); and (v) any other sector TA activities as identified during implementation.

48. **The activities on scaling up RE deployment in Mozambique will significantly contribute to climate change mitigation and adaptation.** All the proposed activities will directly contribute towards climate change mitigation, whereas the activities on development of the RE strategy, guidelines for competitive procurement of RE projects, technical studies for specific projects and identification of network strengthening requirements will adequately embed and reflect climate resilience considerations.

Component 3: Improve Sector Governance (US\$10 million equivalent)

49. **As the power system of Mozambique grows, with increased private sector participation and a larger role for Mozambique in the SAPP region, there is a need to revisit institutional organization of the power sector to adopt and optimize its structure in relation to the various functions in the sector.** This pertains especially to the operation of the transmission system, electricity market structure and operations, and system dispatch. These functions are critical to ensure adequate transmission infrastructure, and operation of the market and the system that would safeguard the technical and commercial integrity of the system and ensure efficient functioning of the market domestically and in regional trade. Effective private sector participation will also require an operationally and financially sound EDM as a credible off-taker, necessitating continued implementation of actions agreed under the FSP along with follow-on operational and financial reforms.

50. **To achieve sector reform objectives, and to provide enhanced support to implementing agencies, this component will include technical assistance and implementation support as follows:**

- a. **Subcomponent 3a. Activities implemented by MIREME (in coordination with ARENE, as needed; US\$2 million equivalent):**
 - i. **Action plan for establishment of independent system operator.** While a National Control Center is under development in Mozambique, there is a need to define the framework and functions of the ISO beyond the establishment of the technical components. The project will develop an action plan for establishing the ISO, including institutional support for its establishment, defining the role of the ISO in system operations and planning, operational support and capacity building.
 - ii. **Establishing institutional, legal and regulatory framework of the power sector in line with Electricity Law.** The project will support TA on the broader institutional and operational structuring of the power sector, including structuring of generation, transmission, distribution, and supply functions, defining overall target market structure of the sector and a transition path towards attaining it, in line with the Electricity Law adopted in 2022.
 - iii. **Private investment in transmission lines.** The project will finance development of regulations, guidelines, processes, and technical assessments towards attracting private investment for development of transmission lines as PPP, including selected lines under future phases of the MPA.



- iv. **Addressing gender gaps in the sector.** Activities will include enhancing MIREME’s capacity to institutionalize gender, increase the participation of women in the sector’s workforce, and support new and strengthened women led and/or owned enterprises in the sector.
- v. **TA, capacity building and implementation support** towards project activities and any relevant sector studies identified during implementation.

b. Subcomponent 3b. Activities implemented by EDM (US\$8 million equivalent):

- i. **EDM operational and financial sustainability.** The project will support improvement in operational and financial performance of EDM through continued implementation of the FSP and other actions. This will include extending the loss reduction program, additional domestic allocation of power from HCB, improvements in service quality of EDM, and any other actions identified during implementation. Such activities will improve EDM’s credibility as an off-taker for private sector RE and transmission projects.
- ii. **Young Professionals Program.** The project will also support EDM’s ongoing Young Professionals Program (YPP). The program aims to build a new generation workforce, with professional experience and enhanced leadership skills. After three years of work experience and a successful performance review, these professionals are transferred to EDM core business areas. The selection process is done by EDM’s HR directorate in coordination with the relevant departments hosting the professionals. At least half of the selected cohort will be women, contributing towards closing gender gaps at the institutional level. The YPP has already been successfully supported by the Mozambique Energy for All Project (ProEnergia, P165453) with eight young professionals incorporated to EDM, and has been replicated under the Sustainable Energy and Broadband access in Rural Mozambique (ProEnergia Plus, P172595) with another eight young professionals recently appointed as part of the PIU.
- iii. **Addressing gender gaps in the sector.** Activities will include increasing the number of female technicians and leaders in energy related fields, increasing the participation of women in sector workforce, and making EDM facilities more adapted to women’s needs and conditions.
- iv. **TA, capacity building and implementation support,** including establishment of a Project Implementation Unit within EDM, and any relevant sector studies identified during implementation. The bulk of the financing under subcomponent 3b is expected to finance project implementation.

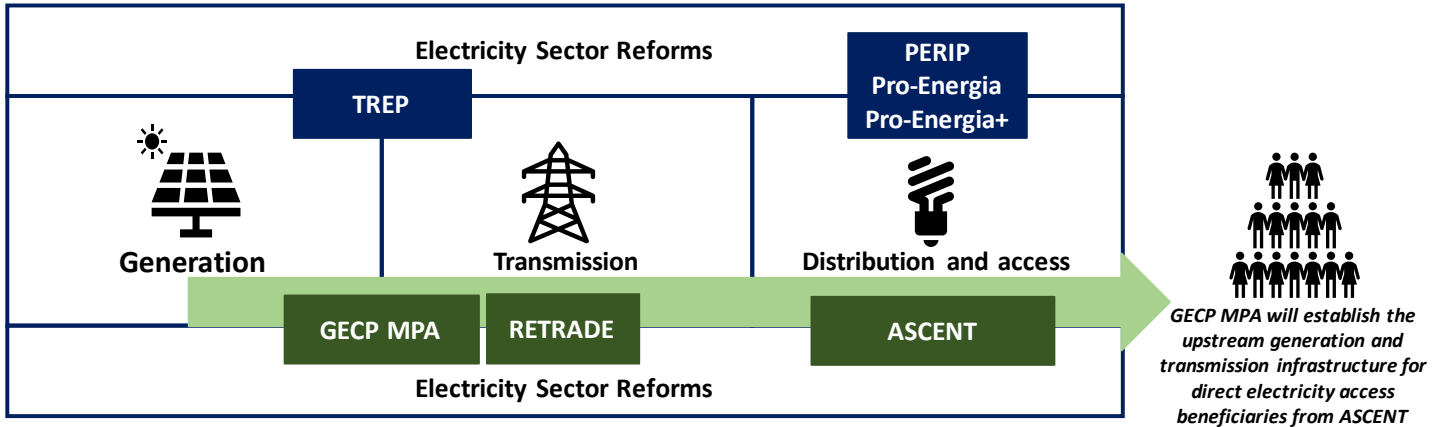
C. Project Beneficiaries

51. **Households, social institutions, and productive enterprises.** The immediate project beneficiaries are the consumers of additional electricity provided by EDM in domestic markets. The increased new transmission capacity will enable enhanced regional trade, lower carbon intensity of generation, connect new consumers and improve services to the existing ones. This applies to residential consumers in rural and urban areas, as well as to schools, hospitals, farmers, businesses, and so on. To these categories, access to electricity and better reliability and quality of supply will mean improved educational and health services, improved productivity, and expanded businesses. These benefits extend to the population at large in Mozambique and in the SAPP through induced job creation and economic growth, and better prospects for poverty alleviation and shared prosperity. This complements efforts currently made under the existing projects, Power Efficiency and Reliability Improvement Project (PERIP; P158249), TREP (P160247) and the planned RETRADE MPA (P175190). The last mile connections will be financed under the upcoming ASCENT Phase 2 (Figure 2).

52. **Mozambique’s power sector institutions.** EDM, MIREME, and ARENE—will also benefit from the project through TA for project implementation, capacity building, and analytical studies, enabling them to better carry out their mandates in investment planning, regional trade, sector regulation, and engagement of the private sector. EDM will directly benefit from additional electricity wheeling from its transmission network as well as from replacement of expensive thermal generation by low-cost renewables enabled by the transmission lines.



Figure 2: Direct Downstream Impact of GECP on Beneficiaries through Access Programs



- **GECP:** Green Energy Corridors MPA (Proposed)
- **RETRADE:** Regional Energy Transmission Trade and Decarbonization (Planned)
- **ASCENT:** Accelerating Sustainable & Clean Energy Access Transformation Program MPA (Mozambique proposed in Phase 2)
- **TREP:** Temane Regional Energy Project (Ongoing)
- **Pro-Energia/Pro-Energia+:** Energy for All/Sustainable Energy and Broadband Access in Rural Mozambique (Ongoing)
- **PERIP:** Power Efficiency and Reliability Improvement Project (Ongoing)

D. Rationale for Bank Involvement and Role of Partners

53. **The rationale for World Bank involvement is multifaceted, from the World Bank’s broader sectoral engagement in project preparation to project structuring, donor coordination, and resource mobilization.** The World Bank’s power sector engagement, involving both investment and policy support, covers a spectrum of strategic issues across the sector’s value chain and regional integration, helping develop the sector in an economically, socially, and financially sustainable manner, including through participation of the private sector. The World Bank’s ongoing power sector engagements across Sub-Saharan Africa which supports the development of regional markets will help leverage global and regional expertise.

54. **The World Bank’s support will provide crucial financing towards the expansion of the electricity sector in Mozambique and toward Mozambique’s and the SAPP’s energy generation and will bring in international expertise in structuring complex projects, particularly in renewable energy.** The World Bank’s financial and technical support will help maximize the developmental impact of the proposed investments by leveraging the use of the scarce public resources and IDA funds to attract private capital and know-how. The World Bank’s international expertise in supporting countries transform the organization of their power sector will also be crucial at this critical juncture in the transformation of Mozambique’s power sector as a regional energy hub.

55. **The project builds upon long-term experience and continued engagement of the World Bank in supporting transmission investments.** The World Bank has substantial global experience over several decades in financing high voltage transmission investments, including several projects in the SAPP region and the TREP (P160427) in Mozambique. In complementarity to the project, the World Bank is funding investment planning and preparation of selected priority regional energy projects in the SAPP through the upcoming RETRADE MPA (P175190) to enhance regional integration. The World Bank is also providing support for the Tanzania-Zambia Transmission Interconnector (P163752), which would connect the East African Power Pool (EAPP) and the SAPP. The World Bank is also supporting TA and capacity building for the EAPP.

56. **The project will leverage co-financing from development partners, strengthening their collaboration with the World Bank on Mozambique’s energy program.** Current collaboration with development partners includes joint co-financing of the national electrification program *Energia para Todos* with the Government of Sweden, Government of Norway and the European Union (EU) through ProEnergia (P165453) and ProEnergia Plus (P172595) as well as parallel financing of TREP (P160427) with the AfDB, Government of Norway, Organization of Petroleum Exporting Countries (OPEC)



and Islamic Development Bank (IsDB). For the scope of this project, the AfDB approved a project in the amount US\$33 million for supporting the Songo-Matambo transmission segment. Separately, the IsDB is financing the first part of the Chimuará-Nacala corridor, which is currently under construction. Other development partners, including the European Investment Bank together with the EU, the *Kreditanstalt für Wiederaufbau* and IsDB, have also expressed interest in financing priority transmission segments.

E. Lessons Learned

57. **The GECP has been designed considering the experience with investment projects in Mozambique and with similar projects within the SAPP region and across Sub-Saharan Africa and elsewhere.** The following are key lessons that have informed and influenced the design of the project:

- (a) **Country ownership and integration of national and regional objectives.** The project is strongly supported by the GoM and EDM due to its contribution to the development agenda of integrating the national transmission system and strengthening interconnections within the region. These reinforcing goals will increase the security, reliability, and affordability of supply and utilize domestic energy resources. The transmission lines in the project are also recognized by the SAPP as crucial for strengthening regional connectivity and trade, and regional access to renewable energy resources in Mozambique.
- (b) **Developing transmission projects at scale with a long-term vision.** Electricity transmission infrastructure must be developed with a long-term sectoral vision. Infrastructure must be developed with scalability to handle longer-term needs, create space for increasing electricity volumes over time, improve reliability, and provide more certainty for future IPP investors as well as those looking to invest in local industries, which requires stable supply of power.
- (c) **Ensuring adequate procurement and contract management measures.** Development of high voltage transmission lines and substation projects requires procurement packages of large volume and ample technical complexity. Adequate care must be taken in procurement to increase the likelihood of the delivery of the project on time and with required quality. The project will implement the newly adopted rated criteria for procurement, which is likely to result in selection of high-quality contractors. The project will also implement lessons learned from the TREP (P160427) and from other transmission projects in the region to improve implementation support under the project.
- (d) **Including citizen engagement and gender activities to enhance project sustainability.** The project incorporates best practices from other energy operations into its design and strengthens the existing channels for engaging with citizens. It ensures that the SEP and the Grievance Redress Mechanisms (GRMs) described in the Environmental and Social Management Framework (ESMF), SEP and Labor Management Procedures (LMP) allow for feedback loops between citizens, workers, and governments during implementation to ensure that citizen voices are taken into account. There will be a strong emphasis on the inclusion of disadvantaged and vulnerable people in consultations. While civil works are ongoing, the contractors will be required to maintain billboards with information about the works and the hotline numbers/channels for residents to use. The project will also support gender activities focused towards institutionalizing gender, increasing the number of women in the energy sector, and fostering productive uses of electricity by linking consumers, financial institutions, suppliers, and business development services agents.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

58. **The project will be implemented by EDM and MIREME.** Project Implementation Units (PIUs) with dedicated staff will be established within EDM and MIREME. EDM will be responsible for the day-to-day management of Component 1, Subcomponent 2b and Subcomponent 3b of the project. MIREME, in co-ordination with ARENE, will implement, TA, capacity building and implementation support activities via Subcomponent 2a and Subcomponent 3a.



59. **To improve coordination, a Steering Committee chaired by MIREME and comprising members from relevant agencies including the Ministry of Economy and Finance (*Ministério da Economia e Finanças, MEF*), will be established.** The Committee will: (a) provide overall guidance on all issues related to the project; (b) facilitate coordination among implementing agencies, relevant sectors, and agencies; and (c) ensure project alignment with the recipient's other programs and provide strategic direction, ensuring adequate coordination between the PIUs and the line ministries and other agencies implementing portions of the project without carrying fiduciary responsibilities.

B. Results Monitoring and Evaluation Arrangements

64. **The monitoring and evaluation of the project will be carried out by the PIUs, consistent with the monitoring and evaluation requirements to be stipulated in the Project Operations Manual (POM).** The PIUs will prepare quarterly reports, which will be submitted to the institutions' Board (as applicable), MIREME, and project financiers, including the World Bank. Activities to be monitored include the procurement, construction progress, contractual payments, and other aspects of contract management and quality control. The reports will also include implementation of Environmental and Social Management Plans (ESMPs), RAPS, health and safety aspects of the project (including a full reporting of incidents), Gender Based Violence (GBV) issues, and training activities. The reports will include project progress and results indicators, as per the project's Results Framework.

60. **EDM and MIREME will prepare financial monitoring reports. Project financial statements will be audited by an independent financial auditor.** EDM and MIREME will share its annual independently audited financial statements, and its performance results under a performance agreement.

C. Sustainability

61. **The project's sustainability depends on EDM's ability to operate and maintain the transmission infrastructure constructed under the project.** As of 2022, EDM owned and operated 6,355 km of high voltage (HV) transmission lines, demonstrating extensive experience with operating and maintaining HV transmission infrastructure. The transmission infrastructure to be developed under the project will allow additional electricity supply to the central and northern regions of the country. It will also enable additional electricity exports through the upcoming interconnection to Malawi (and subsequently to Zambia), offering additional sources of revenue to EDM. This will enable EDM to sustainably operate the line and incur the required operating and maintenance expenditures. This will also be enabled by the new tariff regulation adopted in 2022, which is expected to be applied in 2024. The project will allow additional electricity supply to the central and northern regions of the country.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

65. **The technical feasibility study for the Songo-Matambo segment has demonstrated the need for the line to accommodate domestic demand, additional RE capacity, and the future interconnections with Malawi and Zambia.**²⁵ The existing transmission infrastructure between Songo and Matambo consists of two 220kV old transmission lines, built in the 1980s, with over 37 years of service and capacity limited to 600 MW. One of the lines is rated at 400 MW, and the other at 200 MW. In 2022, the maximum demand was 470 MW, which means that outage in one line will render the other line incapable of meeting the growing demand in the central and northern Mozambique. According to the feasibility study, the 440kV line will accommodate the existing suppressed domestic demand and the expected load growth in the central and northern regions. It will also enable additional capacity for the ongoing 400 kV Mozambique – Malawi interconnection (established contract of 50MW, expandable to 120MW) and the Mozambique – Zambia interconnection (in feasibility stage), both linked to the Matambo substation. Additionally, the ongoing reinforcement of the network to northern

²⁵ The study was completed in July 2023 by *Electricidade de Moçambique* (EDM).



Mozambique particularly the Chimuara – Nacala 400 kV transmission line and the future Chimuara – Inhaminga – Inchope/Dondo 220 kV transmission line, also relies on supply from Matambo. The study also recommended an interconnection from the Cataxa region, with the planned MNHP, to ensure the evacuation of power generated to meet domestic and regional demand.

66. **This project is aligned with the goals of Paris Agreement on both mitigation and adaptation.** The residual risks associated from climate change have been brought to an acceptable threshold level as indicated in the assessment below. (More details can be found in Annex 2).

67. **Assessment and reduction of adaptation risks:** The primary climate and disaster hazards that pose a risk to project investments include wildfires, floods, earthquakes, and extreme heat. In response to these identified risks, we will prioritize resilience strategies to alleviate their effects. For instance, preserving vegetation and opting for light-duty steel instead of wooden poles in transmission systems can reduce wildfire damage. Implementing aerial bundled cables and treating all wooden poles with fire-retardant materials are also advisable. To minimize flood damage, the best strategy is to locate infrastructure in areas with minimal flood risk. If this isn't feasible, employing deep anchors or berms around transmission poles and towers, raising substations, and constructing simple flood walls can help. Extreme heat affects energy demand, reduces transmission and distribution efficiency, causes lines to sag, shortens transformer lifespan, and exacerbates other regional hazards like wildfires. Planning for reduced efficiency of transmission lines and photovoltaic panels, and mitigating line sagging by managing vegetation are crucial in the early stages. Additionally, the expected decrease in transformer operational life and generator output due to rising temperatures should be accounted for by increasing the capacity size, which incurs linear costs. These adaptation measures will enhance the project's resilience, ensuring a more reliable electricity supply and supporting long-term power sector planning and institutional capacity building.

68. **Assessment and reduction of mitigation risks:** The operation has no risk of preventing the country's transition to low-carbon development pathways, given that the program will enable the country to increase the share of low greenhouse gas (GHG) emission sources in its electricity generation mix. Component 1 will finance transmission infrastructure that will enable evacuation of additional renewable energy as well as reduce system losses. The transmission line will transfer clean energy, where potential for future substation to generate future RE (hydro) will be incorporated in the current project design. Component 2 will enable increase in RE generation capacity in Mozambique through support for creating enabling policies and regulations, strategies, capacity building, and technical and transaction advisory. In addition, Component 3 will support critical sector reforms that will lead to removing further barriers to the selection of lower-carbon alternatives in the power sector. Overall, Phase 1 of the project will result in a net GHG emission reduction of 516 tons of CO₂ equivalent (tCO₂e).

Economic and Financial Analysis

69. **The project will have several direct and measurable economic and environmental benefits.** These include meeting electricity demand that is currently unserved due to transmission constraints, reducing technical loss rates, enabling a reduction in the average cost of electricity generation in Mozambique and the SAPP, improving the stability and reliability of power grid operations, and contributing to greenhouse gas mitigation by enabling incremental transmission of greater amounts of low-cost renewable energy. These direct benefits will translate into substantial indirect, long-term benefits, such as higher economic growth driven by increased electricity supply in regions of high economic activity, higher export revenues, improved competitiveness of Mozambique's expanding industrial sector due to reduction in electricity cost, and advances in climate mitigation efforts in the SAPP region. The costs incurred will include investment in transmission lines along with incremental operational expenses and periodic equipment upkeep and replacement costs for EDM.

70. **The project is expected to generate significant positive economic returns.** Accounting for project-financed expenditures for the transmission lines and additional on-going amounts for O&M, Phase 1 of the project is expected to



create positive economic value with a net present value (NPV) of US\$2.6 billion over a 25-year period excluding GHG-related impacts, representing an economic internal rate of return (EIRR) of 45.1 percent for Phase 1 of the project. These benefits arise from the evacuation of substantially inexpensive power from HCB and other renewables, enabled by the proposed transmission line, replacing diesel based self-generation to meet the incremental demand in project-served areas. With respect to GHG emissions from the project, land clearing and use of Sulfur hexafluoride (SF6) in transformer and substation equipment²⁶ will contribute to GHG emissions, which will be offset by emissions associated with technical loss reductions. Overall, Phase 1 of the project will result in a net GHG emission reduction of 516 tons of CO₂ equivalent (tCO₂e). The economic analysis uses a discount rate of 6 percent.

Table 5: Summary of Phase 1 Economic Analysis Results

	NPV (US\$ millions)			E-IRR (%)		
	Excluding GHG	With GHG Impact (low)	With GHG Impact (high)	Excluding GHG	With GHG Impact (low)	With GHG Impact (high)
Project Returns	2,604	2,604	2,604	45.1%	45.1%	45.0%

71. **Financially, the project will offer positive NPV to EDM.** From its ability to export at least 70 MW of additional power to Malawi and to service projected increased domestic demand, EDM will derive meaningful incremental retail tariff revenue and SAPP export sales. These benefits will be offset partially by upfront capex to build the line in Phase 1 and additional incremental O&M costs and expenditures over its useful lives. Accordingly, Phase 1 of the project is expected to yield a positive financial NPV of US\$ 274 million based on incremental benefits (net of costs) accruing to EDM over a 25-year period, representing a financial internal rate of return (IRR) of 35.9 percent.²⁷

Table 6: Summary of Financial Analysis Results for Phase 1

	NPV (US\$ millions)	FIRR (%)
Project Returns	274	35.9%

B. Fiduciary

Financial Management

72. **The overall financial management (FM) was assessed to be adequate with substantial residual risk.** A Financial Management Assessment was undertaken in accordance with the Directives and Policy for IPF and the Bank Guidance - Financial Management Manual in World Bank IPF Operations issued on September 7, 2021. The assessment covered aspects of budgeting, staffing, accounting system, reporting, internal controls, and internal and external audits. The assessment was conducted on EDM and MIREME - the implementing agencies that shall have fiduciary responsibilities over the project. The assessment revealed that there are acceptable financial management arrangements at EDM and MIREME established over time where the two agencies have been implementing other World Bank-financed operations. The teams demonstrated good knowledge of World Bank financed operations, and over time have improved the quality of interim financial reports (IFRs) and timely documentation of outstanding designated account (DA) balances. EDM is currently implementing three ongoing World Bank-financed operations (PERIP, ProEnergia Plus, Malawi Regional Interconnector)²⁸ while MIREME is implementing two (PERIP, ProEnergia Plus)²⁹. Recent FM supervision of the ongoing projects revealed that both entities have weaknesses in financial management capacity, which includes the submission of

²⁶ Sulfur hexafluoride (SF6) is an insulator used to prevent short circuits and electrical arcing in electrical substation equipment, like high voltage switchgear and transformers. It is a potent greenhouse gas with 23,500 times the global warming potential of carbon dioxide.

²⁷ Given ratings Mozambique’s sovereign ratings of ‘C’ / ‘CCC,’ the analysis assumes a discount rate of 13.467 percent based on the yield-to-maturity reading for the ICE BofA ‘CCC’ U.S. Dollar High Yield Bond Index as of January 2, 2024.

²⁸ Power Efficiency and Reliability Improvement Project (PERIP, P158249); Sustainable and Broadband Energy Access in Rural Mozambique (ProEnergia Plus, P175295), and Malawi Regional Interconnector Project (P164354).

²⁹ P158249 - PERIP, P175295- Sustainable and Broadband Energy Access in Rural Mozambique (ProEnergia Plus).



IFRs past the due dates. MIREME, on the other hand, has significant internal control weaknesses. EDM Finance team needs to be strengthened by recruiting an additional accountant to support the project FMS. There is an ongoing recruitment to fill this staffing gap. MIREME is in the process of improving their staffing capacity by appointing a new Finance Officer with adequate FM skills set and hiring a short-term consultant to provide on the job training on FM key areas. The two agencies are audited by the Administrative Tribunal (the country's supreme audit institution) and currently the FY2022 audit reports have been overdue since June 30, 2023. An audit waiver to postpone the audit submission deadline from June 30, 2023, to April 30, 2024, has been granted.

73. **The following FM actions should be implemented to ensure existence of adequate FM arrangements throughout project implementation:** (a) development and adoption of a POM including a section on FM procedures within 30 days from the effective date of the grant, the POMs of the ongoing World Bank supported projects will be the base for preparation of the POM for the proposed project; (b) finalize the recruitment of an additional project Accountant for EDM; (c) customize the existing packages for EDM and MIREME to record the financial transactions of the project; and (d) finalize appointment of a new Finance Officer and recruit a short-term consultant to support FM team; and (e) request to the National Directorate of Planning and Budgeting to register the project's budget.

Procurement

74. **Procurement Procedures:** Activities under the project will be undertaken in accordance with the 'World Bank's Procurement Regulations for IPF Borrowers' (Procurement Regulations) dated September 2023; the 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants' dated July 1, 2016 (Anti-Corruption Guidelines); and the provisions stipulated in the Financing Agreement. The World Bank's Systematic Tracking of Exchanges in Procurement (STEP) will be used to prepare, clear, track, and update procurement plans and conduct all procurement transactions for all implementing agencies of the project. The World Bank will train the procurement staff of agencies who are not familiar with STEP.

75. **Procurement Arrangements and Capacity Assessment:** The procurement activities for the project will be managed by EDM and MIREME.³⁰ The two agencies have substantial exposure to World Bank Procurement Procedures as they currently manage several World Bank financed projects.³¹ The available capacity of EDM and MIREME was reviewed virtually based on the knowledge to the implementing agencies and the following main gaps have been identified, requiring enhancements for the day-to-day management of the future project, which includes the (a) availability of qualified procurement personnel in a manner satisfactory to the World Bank and (b) cumbersome internal approval mechanism (Visa to the contracts by Administrative Tribunal). To mitigate these risks the following measures have been agreed: (a) hire additional qualified personnel, under terms satisfactory to the World Bank to support the procurement function of the World Bank funded projects including the GECP, (b) ensure that the packages for internal approvals by the Administrative Tribunal are carefully prepared with a clear checklist of the documents required for approval of the process and (c) increase interaction with the Administrative Tribunal to learn more about the requirements for submission of the documents for visa. Based on the above assessment and mitigating measures, the residual procurement risk associated with the project is substantial.

C. Legal Operational Policies

³⁰ The two agencies have substantial exposure to World Bank procurement Procedures as they currently manage the following projects: ProEnergia (P165453), PERIP (P158249), and Sustainable Energy and Broadband Access in Rural Mozambique (P175295) Projects.

³¹ ProEnergia (P165453), PERIP (P158249), and Sustainable Energy and Broadband Access in Rural Mozambique (P175295) Projects



Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Area OP 7.60	No

D. Environmental and Social

76. **The project is likely to generate some significant adverse risks and impacts on human populations and the environment through its physical investments, and such risks must be assessed and managed in line with ESS1.** The environmental and social (E&S) risks and impacts potentially generated by the construction of the new 400 kV Songo-Cataxa-Matambo transmission line and upgrade of the existing Songo and Matambo substations (Component 1) are both anticipated to be moderate to substantial, primarily site-specific, temporary, reversible, and manageable through readily available, reliable, and cost-effective mitigation measures.

77. **The Environmental Risk is rated as substantial.** The main environmental risks and impacts include (i) soil erosion, (ii) environmental pollution (soil and water resources contamination, dust and noise emissions, generation of hazardous and non-hazardous waste), (iii) biodiversity loss and interference with habitats (mainly related to vegetation clearing and wildlife mortality), (iv) occupational health and safety risks, (v) community health and safety risks (mainly related to construction induced traffic).

78. **The Social Risk is rated as substantial.** The main social risks and impacts include (a) labor conditions related issues, (b) community health and safety risks (mainly related to GBV/SEA/SH risks, and spread of communicable diseases), (c) involuntary resettlement due to land acquisition, and (d) interference with cultural heritage (such as graves and spirit houses) and chance findings.

79. **Technical assistance.** The TA Type 1 (preparation of pre-feasibility and feasibility studies, resource assessments, ESIA) planned under Component 1 to strengthen the competitive procurement of RE on a large scale may generate downstream implications with adverse moderate to substantial risks and impacts. TA type 2 (preparation of regulations) and type 3 (capacity building) activities planned under Components 2 and 3 may have more diffuse and induced impacts ranging from low to moderate, often playing out over a longer term. The anticipated downstream risks and impacts of TA activities will be managed through ToR developed for those activities that ensure that relevant E&S issues are considered in conducting the activities in a manner consistent with the World Bank Environment and Social Framework (ESF). The project will not finance TA activities with anticipated high adverse E&S downstream implications. With this aim, an exclusion list of activities will be prepared and included in the POM.

80. **Instruments prepared.** EDM has prepared and disclosed in-country³² an ESIA (October 2022), an Environmental and Social Management Plan (ESMP) (December 2022), a RAP (September 2023) and a Livelihood Restoration Plan (LRP) (September 2023) for the new Transmission Line and substations, which have been reviewed by the Bank and will be updated and disclosed no later than one month after effectiveness of the grant. Based on the ESIA/ESMP, the contractor(s) will prepare Construction ESMPs (C-ESMPs), informed by the project final design, before the commencement of any works. The project implementation will require the mobilization of a significant number of workers (unknown at the current stage), namely workers hired by the contractor(s) and subcontractor(s) involved in the transmission line civil works. The EDM will prepare Labor Management Procedures (LMP), including a GRM for workers, and disclose them in-country no later than one month after the effective date. A SEP was prepared by EDM and disclosed on the World Bank website and in-country³³ on February 26, 2024 and will be updated and redisclosed in-country and on the World Bank site no later than

³²Documents are disclosed on EDM’s website: <https://www.edm.co.mz/>

³³ Ibid.



one month after the Effective Date. It summarizes the main outcomes of the stakeholders consultations conducted between December 2022 and March 2023, during the preparation of the ESIA and RAP for Songo-Matambo transmission line. An Environmental and Social Commitment Plan (ESCP) setting out the E&S commitments for the project was prepared by EDM with the Bank support and disclosed on February 26, 2024.

Gender

81. **Women in Mozambique face challenges in the energy sector as consumers, workers/entrepreneurs and at the institutional level.** Girls and women have lower education and skills training than men, and gender disparities persist in the pipeline of trained technicians to the energy sector (only 30 percent of tertiary level STEM graduates are female). Women are more likely to work in the informal sector, to own informal businesses and to be engaged in lower paying activities. In the energy sector, women are overall underrepresented and represent only 18 percent of EDM's total staff. Women-led and/or owned private sector companies in the sector face bottlenecks in accessing information and finance, which limits their potential to successfully bid for public procurement processes. The GoM has put in place the institutional framework to promote gender equality in the sector, but the lack of trained staff and financial resources has limited its success. Although there is a pervasive lack of data, there are trends suggesting feminized energy poverty, with female-headed households less connected to electricity and women benefitting (overall) less from electrification.

82. **The project proposes a set of targeted interventions focused on enhancing gender equality in the electricity sector and reducing identified gender gaps.** Activities will focus on five core interventions: (a) enhance MIREME's capacity to institutionalize gender, by implementing a structured training plan, targeting the staff in the provinces outside Maputo and focus on integrating the gender approach in the development of the RE strategy and secondary legislation; (b) increase the number of female technicians in energy related fields, by training 250 female students in relevant areas for the sector; (c) increase the participation of women in the sector's workforce, by contributing to the achievement of EDM's female participation on the workforce target and a set of mechanisms to promote hiring of the trained technicians by the private sector; (d) support new and strengthened women led and/or women owned enterprises in the sector, by facilitating access to training, business development services and finance; and (e) make EDM facilities more adapted to women's needs and conditions, ensuring that these are not blockages to hiring and retaining women.

83. **Gender M&E.** The following indicators are included in the results framework to track progress toward closing the gender gaps in Mozambique's electricity sector: (a) Percentage of females trained by the project that intern at EDM; (b) Percentage of women among the professionals selected for the Young Professionals Program (YPP) at EDM.

V. GRIEVANCE REDRESS SERVICES

84. **Grievance Redress.** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's Grievance Redress Service (GRS), visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the Bank's Accountability Mechanism, visit <https://accountability.worldbank.org>.

VI. KEY RISKS



85. **The overall residual risk rating for both the MPA and the project is Substantial, based on substantial risks across the categories of political and governance, sector strategies and policies, fiduciary, and environmental and social.** Mitigation measures have been identified across these risk categories as described below.

86. **Political and Governance risk is Substantial.** While the political environment is stable, Mozambique will hold general elections in 2024, which may change sector priorities of a newly elected government. Support for Mozambique's universal access agenda and vision to position itself as a regional power hub will likely be sustained by any newly elected government. At the same time, given historical political interference in the power sector, the political and governance risk is assessed as substantial. As a mitigation measure, a Power Sector Master Plan will be prepared by the end of 2024, which will inform the future investment priorities for generation and transmission investments until 2047 based on least-cost analysis. The technical assistance towards developing sector strategies, policies, and regulations for developing RE and improving sector governance will also help improve the sustainability of sector priorities.

87. **Sector strategies and Policies is Substantial.** The GoM has approved sector strategies and policies centered around the goals of reaching universal access to electricity by 2030 and positioning Mozambique as a regional power hub. The Integrated Power Sector Master Plan from 2018 is the main plan governing transmission and generation investments aiming to increase installed capacity to 6,001 MW by 2030 and 20 percent integration of renewable energy in the grid. Despite this plan, there are still a variety of unsolicited power projects being implemented in the country. Transparency with regards to investment prioritization needs to be improved going forward. Mitigation measures: As mentioned above, the Power Sector Master Plan is being up-dated, which will determine the high priority least-cost power generation and transmission projects. The project will also support development of specific policies and will strengthen in-house capacity of sector entities towards improving competitive procurement of generation and transmission projects. With an updated masterplan defining priority investments, and with enhanced regulatory framework and capacity to implement competitive procurement, the residual risk in this category is expected to be substantial.

88. **Fiduciary risk is Substantial.** Both residual FM risk and residual procurement risk are assessed as substantial due to capacity issues arising from the increased number of activities to be implemented by EDM based on the currently available capacity, the country context, weak public financial management (PFM) capacities, and governance issues. Mitigation measures: The following measures will be implemented: (a) include FM and procurement procedures acceptable to the World Bank in the POM, (b) recruit project FM and procurement personnel to strengthen capacity for implementation in EDM and MIREME, and (c) offer anti-corruption training for the FM and procurement personnel.

89. **Environmental and Social risk is Substantial.** The Environmental and Social Risk Classification (ESRC) is rated as substantial due to some significant adverse E&S risks and impacts potentially generated by the physical investments planned under Component 1 including (i) soil erosion, (ii) environmental pollution, (iii) biodiversity loss and interference with habitats, (iv) labor conditions related issues and occupational health and safety risks, (v) community health and safety risks, (vi) involuntary resettlement due to land acquisition, and (vii) interference with cultural heritage and chance findings, and the downstream implications of the TA Type 1 with adverse moderate to substantial risks. Mitigation measures will include the following: (a) hire or appointment of qualified staff for the PIU based at EDM to support the management of ESHS risks and impacts, including one Environmental Specialist, one Occupational Health and Safety Specialist, one Social Specialist, one GBV Specialist and two Community/GBV liaisons, (b) adopt and implement a set of E&S instruments materially consistent with ESF, including ESIA/ESMP, RAP, LRP, LMP, SEP, (c) ensure TA activities are carried out in accordance with ToR that are consistent with the ESF.



VII. RESULTS FRAMEWORK AND MONITORING

PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Closing Period
Strengthen the electricity network			
PrDO 1: Additional transmission hosting capacity enabled (Megawatt)			
Jun/2024	Jun/2030	Jun/2032	Jun/2033
0	500	1000	1500
➤Phase 1 PDO Indicator: Additional transmission hosting capacity enabled in EDM’s transmission grid (Megawatt)			
Jun/2024	Jun/2027		Jun/2030
0	0		500
Increase regional power trade			
PrDO 2: Additional electricity trade capacity enabled between Mozambique and the SAPP members (Megawatt)			
Jun/2024	Jun/2030		Jun/2033
0	70		150
➤Phase 1 PDO Indicator: Additional electricity trade capacity enabled between Mozambique and Malawi (Megawatt)			
Jun/2024	Jun/2027		Jun/2030
0	0		70
Improve Sector Governance			
PrDO 3: Independent System Operator (ISO) established (Yes/No)			
Jun/2024	Jun/2030	Jun/2032	Jun/2033
No	No	No	Yes
Enable renewable electricity generation through private sector participation			
PrDO 4: Increased renewable electricity generation capacity (Megawatt)			
Jun/2024	Jun/2030	Jun/2032	Jun/2033
0	0	200	400
PrDO 5: Private and commercial capital mobilized (Amount(USD))			
Jun/2024	Jun/2030	Jun/2032	Jun/2033
0	0	300,000,000	600,000,000



Intermediate Indicators by Components

Baseline	Period 1	Closing Period
Component 1: Strengthen transmission infrastructure		
400 kV transmission lines constructed (Kilometers)		
Jun/2024	Jun/2027	Jun/2030
0	80	118
Sub-stations constructed/rehabilitated (Number)		
Jun/2024	Jun/2027	Jun/2030
0	1	2
Additional annual electricity exports from Mozambique to Malawi (Gigawatt-hour (GWh))		
Jun/2024	Jun/2027	Jun/2030
0	0	613
Component 2: Enable renewable energy at scale		
Number of policies/regulations on development of renewable energy adopted (Number)		
Jun/2024	Jun/2027	Jun/2030
0	1	2
National renewable energy strategy prepared (Yes/No)		
Jun/2024	Jun/2027	Jun/2030
No	Yes	Yes
Component 3: Improve sector governance		
Action Plan for implementation of Independent System Operator (ISO) adopted. (Yes/No)		
Jun/2024	Jun/2027	Jun/2030
No	No	Yes
Percentage of women among the professionals selected for the Young Professionals Program at EDM (Percentage)		
Jun/2024	Jun/2027	Jun/2030
0	50	50
Percentage of females trained by the project that intern at EDM (Percentage)		
Jun/2024	Jun/2027	Jun/2030
0	20	40
Project related grievances addressed (Percentage)		
Jun/2024	Jun/2027	Dec/2030
0	100	100
Annual consultation with identified affected stakeholders (Yes/No)		



The World Bank

Green Energy Corridors Project(P179797)

Jun/2024	Jun/2027	Jun/2030
No	Yes	Yes



Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

Strengthen the electricity network	
Phase 1 PDO Indicator: Additional transmission hosting capacity enabled in EDM's transmission grid (Megawatt)	
Description	This indicator is estimated as 20 percent of the expected thermal rating of the Songo-Matambo 400 kV transmission line.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Transmission project completion report or equivalent document.
Responsibility for Data Collection	EDM

Increase regional power trade	
Phase 1 PDO Indicator: Additional electricity trade capacity enabled between Mozambique and Malawi (Megawatt)	
Description	This indicator will capture the incremental electricity trade capacity between Mozambique and Malawi that will be unlocked due to the Songo-Matambo transmission corridor upgrade.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Transmission project completion report or equivalent document.
Responsibility for Data Collection	EDM

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Strengthen transmission infrastructure	
400 kV Transmission lines constructed (Kilometers)	
Description	This indicator will capture the construction progress of the Songo – Cataxa – Matambo transmission line in kilometers.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Contractor reports submitted to EDM.
Responsibility for Data Collection	EDM
Substations constructed/rehabilitated (Number)	
Description	This indicator will capture the proposed upgrades at the Songo and Matambo substations proposed under the project.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Contractor reports submitted to EDM.
Responsibility for Data Collection	EDM
Additional annual electricity exports from Mozambique to Malawi (Gigawatt-hour (GWh))	
Description	This indicator will capture the annual incremental electricity exports from Mozambique to Malawi after completion of the Songo-Matambo transmission line and execution of the electricity trade agreement between Mozambique and Malawi. The target is estimated as additional trade capacity enabled (70 MW) times load factor (100%) times hours per year.
Frequency	Annual
Data Source	EDM
Methodology for Data Collection	Electricity export data compiled by EDM's market operator
Methodology for Data Collection	EDM



Enable renewable energy at scale	
Number of policies/regulations on development of renewable energy adopted (Number)	
Description	This indicator will capture the policies/regulations developed by MIREME and/or ARENE related to development of renewable energy in Mozambique supported by the project.
Frequency	Annual
Data source	MIREME, ARENE
Methodology for Data Collection	Policies and regulations announced in the official gazette of the Republic of Mozambique
Responsibility for Data Collection	MIREME, ARENE
National renewable energy strategy prepared (Yes/No)	
Description	This indicator will capture development of a national renewable energy strategy by MIREME, in line with the energy transition strategy and other sector policies and regulations, with support of the project.
Frequency	Annual
Data source	MIREME
Methodology for Data Collection	Publication of the national renewable energy strategy by Mozambique.
Responsibility for Data Collection	MIREME
Improve sector governance	
Action Plan for implementation of Independent System Operator adopted (Yes/No)	
Description	This indicator will capture development and adoption of an action plan for establishing the ISO, including institutional support for its establishment, defining the role of the ISO in system operations and planning, operational support and capacity building.
Frequency	Annual
Data source	MIREME
Methodology for Data Collection	Publication of the action plan by MIREME and/or minutes of a meeting disclosing adoption of the action plan.
Responsibility for Data Collection	MIREME
Percentage of women among the professionals selected for the Young Professionals Program at EDM (Percentage)	
Description	The ongoing Young Professionals Program (YPP) at EDM aims to build a new generation workforce, with professional experience and enhanced leadership skills. EDM will ensure 50 percent of the selected professionals will be women, which contributes towards closing gender gaps at the institutional level.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Based on annual aggregated data on the recruited cohort of young professionals at EDM.
Responsibility for Data Collection	EDM
Percentage of females trained by the project that intern at EDM (Percentage)	
Description	This indicator will capture the conversion rate of females trained by the project funding into actual internships at EDM.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Tallying the record of females trained by the project with the annual internship records of EDM.
Responsibility for Data Collection	EDM
Project related grievances addressed (Percentage)	
Description	EDM addresses all complaints submitted through the Grievance Redressal Mechanism (GRM).
Frequency	Annual
Data source	EDM



Methodology for Data Collection	Reports prepared by the Grievance Redressal Committees to be established by the project.
Responsibility for Data Collection	EDM
Annual consultation with identified affected stakeholders (Yes/No)	
Description	The indicator presents whether consultation meetings with the affected stakeholders are taking place at least once a year.
Frequency	Annual
Data source	EDM
Methodology for Data Collection	Reports on stakeholder consultation shared with the World Bank.
Responsibility for Data Collection	EDM



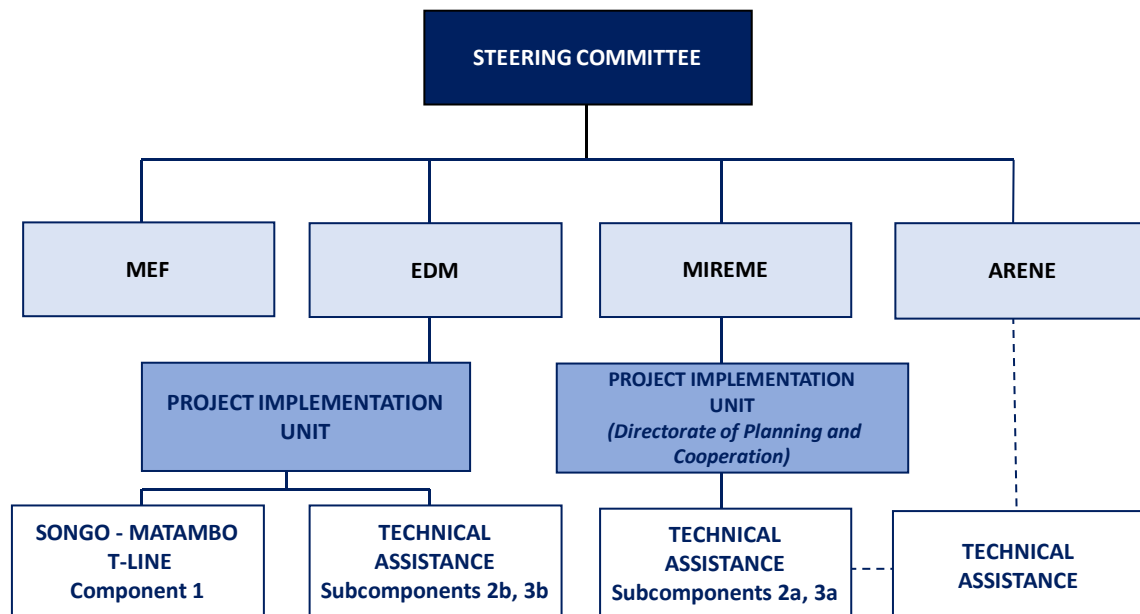
ANNEX 1: Implementation Arrangements and Support Plan

Project Institutional and Implementation Arrangements

1. The project will be implemented by EDM and MIREME. Project Implementation Units (PIUs) with dedicated staff will be established within EDM and MIREME. EDM will be responsible for the day-to-day management of Component 1, Sub-component 2b and Sub-component 3b of the project. EDM has substantial experience in implementing large investment programs across generation, transmission, regional trade and distribution. With regards to transmission infrastructure, World Bank-supported projects including the Temane Transmission project (through the Sociedade Nacional de Transporte de Energia [SNTE] – a wholly owned subsidiary of EDM) as well as the Mozambique-Malawi Interconnector Project have further increased EDM’s experience and capacity to implement investment projects of this magnitude. EDM has also implemented TA through multiple World Bank-financed energy projects. MIREME, in coordination with ARENE, will implement TA, capacity building, and implementation support activities via Sub-component 2a and Sub-component 3a. MIREME has ample experience implementing World Bank-financed energy projects, including TA through the TREP and PERIP projects. A Project Operations Manual (POM) will be developed to guide project implementation.

2. To improve coordination, a steering committee chaired by MIREME and comprising members from relevant agencies including the Ministry of Economy and Finance, will be established to: (a) provide overall guidance on all issues related to the project; (b) facilitate coordination among implementing agencies, relevant sectors, and agencies; and (c) ensure project alignment with the recipient’s other programs and provide strategic direction, ensuring adequate coordination between the PIUs and the line ministries and other agencies implementing portions of the project without carrying fiduciary responsibilities.

Figure 1.1. Implementation Arrangements



The technical assistance for ARENE will be managed by MIREME.



3. **The World Bank will carry out implementation support missions at least twice a year, in coordination with other development partners.** The World Bank will review project reports, procurement, financial monitoring reports, financial audit reports, and other relevant project documents. The World Bank will carry out a midterm project implementation review (about two years after project effectiveness). The midterm review will be coordinated with other development partners. The World Bank will prepare an Implementation Completion and Results Report at the end of the project.

Financial Management

4. **FM arrangements.** The project funds, expenditures, and resources will be accounted for using the existing accounting package by EDM, while MIREME will make use of the accounting software that is being installed under the ongoing projects. The basis of accounting will be Financial Reporting under Cash Basis of Accounting. Internal controls system and procedures of the project will be based on national procedures, defined in the Financial Administration Manual (*Manual de Administração Financeira*, MAF) and the POM. The IDA funds will be disbursed on report basis (the unaudited interim financial reports) using the following methods: (a) reimbursement; (b) advances; (c) direct payments; and (d) special commitments. The two implementing entities will prepare quarterly unaudited interim financial reports (IFRs) and provide such reports to the World Bank within 45 days of the end of each calendar quarter. The project financial statements components to be implemented by MIREME will be audited annually by the Administrative Tribunal, while those for EDM will be audited by a private audit firm. The audit reports together with separate Management Letters for each implementing entity will be submitted to the World Bank no later than six months after the end of each fiscal year.

5. **Risk assessment and mitigation measures.** The overall financial management was assessed with substantial residual risk due to that fact that despite having experience in managing World Bank-financed operations EDM and MIREME are still working to improve their staff capacity.

6. **Financial Management Risks.** The financial management risks are identified, and the proposed mitigation measures are summarized in the table 1.1.

Table 1.1. Risk Assessment and Mitigation Measures

Risk factors/Description of Risk	Risk Mitigating Measures Incorporated into the Project Design	Conditions of Negotiations, Board or Effectiveness (Yes or No)	Residual Risk Rating
Country level: Shortage of human resources, limited capacities for key FM functions, and overall weak public finance management control environment may have a negative impact on the implementation of the proposed project expenditures.	The Government is committed to implementing further reforms of the country’s PFMs with support from the World Bank and other development partners. The World Bank has several initiatives and projects under preparation that will strengthen the FM systems.	No	S
Entity level: The two agencies have experience in handling FM matters of Bank-financed project including. However, the fact that these agencies will have an additional operation poses a risk as it could	The financial staff of the two agencies are experienced in handling World Bank-financed operations. The EDM FM capacity is being strengthened by recruitment of an additional project accountant. MIREME will appoint a new FM Specialist and hire a short-term consultant to improve its FM skills set.	No	M



Risk factors/Description of Risk	Risk Mitigating Measures Incorporated into the Project Design	Conditions of Negotiations, Board or Effectiveness (Yes or No)	Residual Risk Rating
jeopardize their ability to satisfactorily implement all the projects.			
Project level: The resources of the project may not be used for the purpose intended.	Develop the POM which will include the implementation arrangements of the project. EDM and MIREME have experience in handling similar activities. The supervision of activities will be observed, and the World Bank team will conduct regular technical supervision.	Yes. Develop and adopt the POM 30 days after effective date.	M
Budgeting: The two agencies may not be able to produce realistic and comprehensive budget due to capacity constraint and the fact that the project has other beneficiary entities may pose the risk of not capturing all budget needs and in a timely manner. This has been a challenge with the ongoing projects.	The POM including FM procedures will be developed. Core staff involved in the budget preparation will be trained. Adequate coordination with ARENE, beneficiary entity, when preparing and monitoring budget execution. The World Bank will review the draft budget as well as the IFR and provide comments.	No. Develop and adopt the POM 30 days after effective date.	S
Accounting: Project funds, expenditures, and resources are not properly recorded as EDM and MIREME are accounting for other projects and may be confused in handling records of the project transactions.	EDM and MIREME will make use of the automated accounting package to account for project funds, expenditures, and resources. EDM has an existing accounting software while MIREME's is currently being installed. In doing so, the accounting packages will be customized for separately recording project transactions and production of financial reports. EDM's capacity is being strengthened by the appointment of one additional project accountant while MIREME will appoint a new Finance Officer with adequate accounting skills set. MIREME should register the project with the National Directorate of Budget for new codes be created for it in e-SISTAFE.	No	S



Risk factors/Description of Risk	Risk Mitigating Measures Incorporated into the Project Design	Conditions of Negotiations, Board or Effectiveness (Yes or No)	Residual Risk Rating
Internal control: Non-compliance with key project internal control procedures due to weak internal control environment and oversight mechanisms in the country.	<p>The project will follow the procedures documented in the <i>Manual de Administração Financeira</i> (MAF), which has been designed to mitigate internal control risk, and those to be documented in the POM.</p> <p>The POM will include the process of approval of progress certificates and processing of payments. No major issues have been raised by auditors for the ongoing projects.</p>	No. Develop and adopt the POM within 30 days of the effective date.	S
Funds flow: Delays in payments to the contracts and suppliers may negatively impact implementation of project activities.	<p>The disbursement arrangements will be documented in the POM.</p> <p>Disbursements of the project will be handled by project finance staff who have prior experience with World Bank-financed operations, on the other hand the ongoing initiatives to improve FM capacity at both entities will require additional training to FM staff. Training requirements will be developed.</p>	No	M
Financial reporting: The two agencies may fail to produce project financial reports in a timely manner due to the nature and coverage of the project.	<p>EDM will use an automated accounting software to account for project funds, expenditures, and resources.</p> <p>The two agencies are submitting financial reports on a regular basis.</p>	No	M
Auditing: Delays in submission of audit reports and delays in implementing the recommendations of the Management Letter.	<p>Overdue audit report for the two agencies for more than 6 months. The World Bank will monitor audit submission compliance and ensure implementation of World Bank’s recommendations.</p> <p>The audit ToRs will be discussed and agreed with these agencies. The ToRs will emphasize the needs for physical verification.</p>	No. Submission of audit report extended to April 30, 2024.	S



Risk factors/Description of Risk	Risk Mitigating Measures Incorporated into the Project Design	Conditions of Negotiations, Board or Effectiveness (Yes or No)	Residual Risk Rating
Governance and Accountability: Possibility of corrupt practices including bribes, abuse of administrative and political positions, mis-procurement, and misuse of funds and so on, are critical issues.	Robust FM arrangements (including a comprehensive internal and external audit of the project operations, World Bank FM supervision including review of transactions and asset verification) designed to mitigate the fiduciary risks in addition to agencies overall internal control systems. Clear protocol for sanctions or remedies for misuse of project funds should be determined and well publicized. The project will be ring-fenced, and it will finance the improvement of the EDM governance.	No	S
OVERALL FM RISK			S

Note: H = High, S = Substantial; M: Moderate

Table 1.2. FM Action Plan. To mitigate FM risks, the following measures should be taken.

No.	Action	Responsibility	Completion date
1	Receive the overdue FY 2022 audit reports.	EDM, MIREME and Administrative Tribunal	By April 30, 2024
2	Develop and adopt the Project Operations Manual including FM procedures.	EDM, MIREME	Within 30 days after the effective date
3	Preparation of Audit TOR.	EDM, MIREME	Within 30 days after the effective date
4	Customize the accounting packages to maintain separate records and ledger accounts for the proposed project.	EDM, MIREME	Within two months after the effective date
5	Recruitment of one additional project Accountant for EDM.	EDM	Within three months after the effective date
6	Request National Directorate of Planning and Budgeting to register the project's budget.	MIREME	Within one month after the signing of the Financial Agreement
7	Appoint a new Finance Officer and recruit a short-term consultant to support the FM team under that the programmatic PPA, currently in the pipeline.	MIREME	Before project effectiveness

Note: H = High, S = Substantial; M: Moderate.

7. **Budgeting.** Budget preparation and monitoring budget execution will follow national procedures and those to be documented in the POM. EDM and MIREME, will prepare annual budgets based on the annual work plans and the approved Procurement Plans. It is expected that these agencies will prepare annual budgets that cover activities proposed to be carried out in each fiscal year before the commencement of each fiscal year. Each entity will be responsible for producing variance analysis reports comparing planned with actual expenditures on a quarterly basis. These quarterly variance analysis reports will be part of the IFRs that will be submitted to the World Bank on a quarterly basis.



8. **Staffing.** The EDM and MIREME will be responsible for fiduciary aspects of the project. The two agencies have finance staff with acceptable skills and experiences to handle FM and disbursement matters of the World Bank-financed operations. However, the EDM FM capacity needs to be strengthened by recruiting one additional accountant to ensure adequate FM staffing due to the increased number of World Bank-financed operations. MIREME will benefit from pipeline PPA actions as follows: appoint a new finance officer (FO) with the necessary accounting background and hire a short-term consultant to provide on the job training on Financial Management to the newly appointed FO. This will help improve the current FM performance.

9. **Internal control.** Internal controls system and procedures of the project will be based on national procedures, defined in the *Manual de Administração Financeira* (MAF) and the POM. The POMs of the ongoing projects will be the basis for preparation of the POM of this proposed project. EDM has internal audit units, and these should be included in its annual plans, for auditing of project operations. The internal audit reports should be submitted twice a year. The project may also be subject to the review of the General Inspectorate of Finance (*Inspeção Geral das Finanças* [IGF]) based at the Ministry of Economy and Finance. The IGF will be required to include the internal audit review of this project in their annual plan. Under these circumstances, the World Bank team will provide remote support to the project through internet solutions and phone calls. Despite EDM's weak governance (such as lack of transparent procurement mechanisms for national competitive bidding and post review processes, poor oversight in its operations) the proposed project will be ring-fenced as the utility has a dedicated team to handle its FM matters and the project will finance activities toward improvement of the utility's governance. The project will use the World Bank's Procurement Framework. The Project Procurement Strategy for Development (PPSD) and Procurement Plan have been prepared in collaboration with the World Bank.

10. **Accounting.** EDM will account for all project funds, expenditures, and resources using the existing accounting packages, which are adequate as it can produce reliable financial reports required to monitor and effectively manage the progress of the project. The accounting packages will be customized to maintain separate records and ledger accounts for the proposed project and allow for preparation of project specific financial reports. The e-SISTAFE is used for most World Bank-financed operations in Mozambique's portfolio; however, under this project MIREME should register the project with the National Directorate of Planning and Budgeting for project budget registration and to be able to send through project financial information at the end of each quarter. The project will follow e-SISTAFE's internal control procedures laid down in the Government's financial management regulations. MIREME will request the National Directorate of Planning and Budgeting to register the project budget and finalize the installation of the accounting software being purchased under the ongoing projects.

11. **Financial Reporting.** The two agencies are producing acceptable quarterly IFR for the ongoing operations. Each implementing agency will prepare separate quarterly IFRs for the project in a form and content satisfactory to the World Bank, which will be submitted to the World Bank within 45 days after the end of the quarter to which they relate. The formats will be similar to those currently in use for ongoing projects. However, these implementing agencies will make use of internet solutions to mitigate this challenge. At the end of each fiscal year, the agencies will also produce separate annual project financial statements (PFS) in accordance with Financial Reporting under Cash Basis of Accounting. In addition, the project financial statements PFS's components will be outlined in the terms of reference for audit of this proposed project.

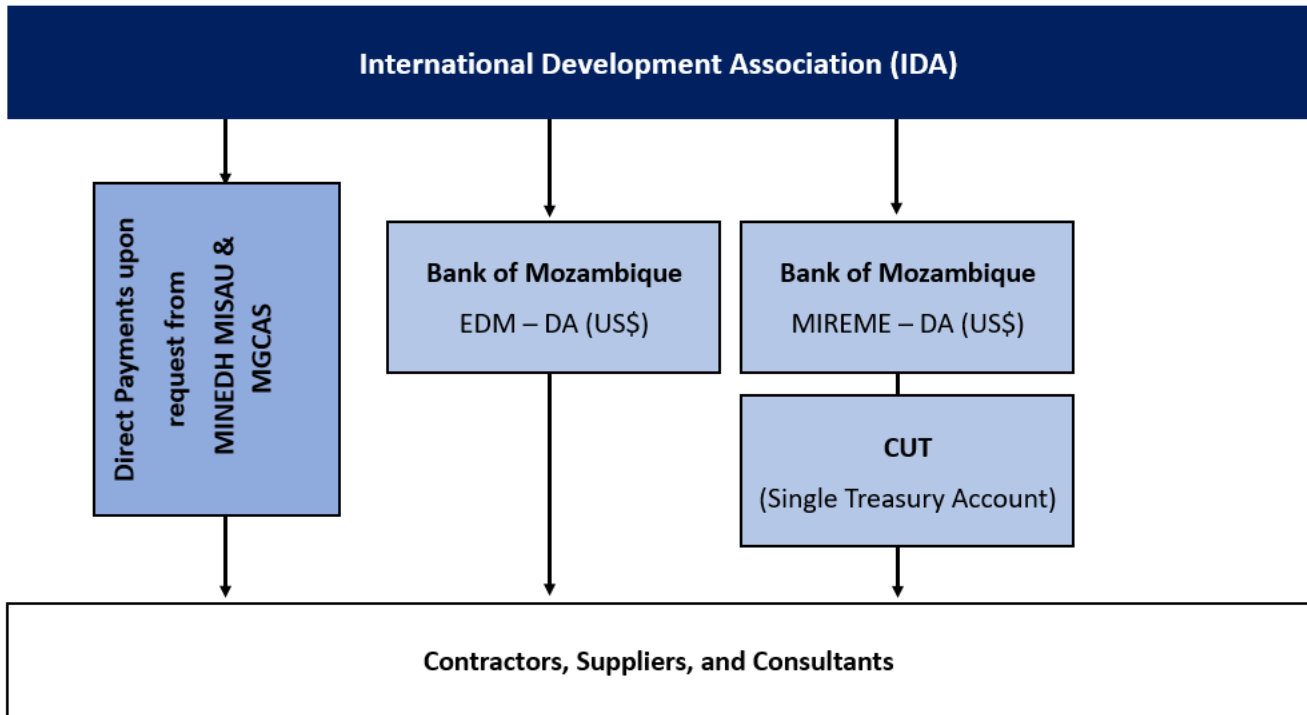
Disbursement

12. **Funds Flow.** Two Designated Accounts (DAs) in US dollars to be managed by EDM and MIREME, respectively, will be opened at the Bank of Mozambique (Central Bank) to receive funds from IDA. Payments of eligible project expenditures will be made from the DAs managed by EDM and MIREME to contractors, suppliers, and consultants. All payments to local suppliers and consultants will be made strictly in local currency in compliance with Mozambique exchange control rules



and regulations. The figure below shows funds flow mechanism for the project activities.

Figure 1.2. Funds Flow Mechanism



13. **Disbursement arrangements.** Disbursements will be done on a report basis (unaudited interim financial reports [IFR]). An initial advance will be made into each of the Designated Accounts upon the effectiveness of the Financing Agreement, based on cash forecast to meet the project expenditures for the first two quarters. After every subsequent quarter, EDM and MIREME will submit the IFRs. The cash requests at the reporting date will be the amount required for the forecast period as shown in the approved IFRs less the balances in the DAs at the end of the quarter.

14. The option of disbursing the IDA funds through direct payment, reimbursement, and special commitment will also be available. To facilitate the payments of contractors, suppliers, and consultants, a lower minimum threshold for the use of direct payment and reimbursement methods of disbursement will be applied for this operation. The World Bank will issue the Disbursement Letter and Financial Information Letter, which will specify the additional instructions for withdrawal of the proceeds of the IPF.

15. **Auditing.** The Administrative Tribunal (the country's supreme audit institution) is mandated to audit all government funds, including donor-financed projects. The project financial statements of the components to be implemented by MIREME will be audited by the Administrative Tribunal in accordance with International Standards of Supreme Audit Institutions (ISSAIs) issued by the International Organization of Supreme Audit Institutions (INTOSAI). The project financial statement of the components to be implemented by EDM will be audited by a private audit firm acceptable to the World Bank in accordance with International Standards on Auditing as issued by the International Auditing and Assurance Standards Board (IAASB) within the International Federation of Accounts (IFAC). The audit reports together with separate Management Letters will be submitted to the World Bank within six months after the financial year-end.



16. **Implementation support plan.** Based on the current overall FM risk of this operation and considering the nature of the project, the project will be supervised at least twice a year. In addition to desk-based reviews, the World Bank will perform field visits to ensure that project's FM arrangements operate as intended.

Procurement

17. **Applicable procedures.** Activities under the project will be undertaken in accordance with 'The World Bank's Procurement Regulations for IPF Borrowers' (Procurement Regulations) dated September 2023; the 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants' dated July 1, 2016; and the provisions stipulated in the Financing Agreement. The World Bank's STEP will be used to prepare, clear, track, and update procurement plans and conduct all procurement transactions for all implementing agencies of the project.

18. **World Bank Standard Procurement Documents.** The World Bank's Standard Procurement Documents (SPDs) shall be used for procurement of goods, works, and non-consulting services under International Competitive Procurement. National bidding documents may be used under National Procurement Procedures subject to the exceptions stipulated in the textual part of the Procurement Plan, consistent with the prevailing World Bank Procurement Regulations for IPF Borrowers. Similarly, the selection of consultant firms shall use the World Bank's SPDs, in line with procedures described in the Procurement Regulations.

19. **National procurement procedure.** When approaching the national market, the country's own procurement procedures may be used as agreed in the Procurement Plan. These procurement procedures shall be consistent with the World Bank's Procurement Principles and ensure that the World Bank's Anti-Corruption Guidelines and Sanctions Framework and contractual remedies set out in its Legal Agreement apply.

20. **Assessment of national procedures.** The Mozambique Procurement Regulations, approved by Decree 5/2016 of March 8/2016, has been assessed, as required under the World Bank's Procurement Framework. The assessment indicated that the country's regulations are generally consistent with international best practice for the following reasons: (a) there is adequate advertising in national media; (b) the procurement is generally open to eligible firms from any country; (c) contract documents have an appropriate allocation of responsibilities, risks, and liabilities; (d) there is publication of contract award information in local newspapers of wide circulation; (e) the national regulations do not preclude the World Bank from its rights to review procurement documentation and activities under the financing; (f) there is an acceptable complaints mechanism; and (g) there is maintenance of records of the procurement process.

21. **Project Procurement Strategy for Development (PPSD) and Procurement plan (PP):** EDM and MIREME have prepared the PPSD and PP which were approved by the World Bank. The procurement plan covers at least the first 18 months of the project implementation. The PPSD outlines the approach and protocol to implement a fit-for-purpose procurement and achieves value for money. The PPSD is a living document that shall be regularly updated during project implementation to provide necessary justifications for procurement arrangements, Procurement Plan, and their updates. The processing of these activities will be done in real time through the World Bank's tracking system—STEP.

22. **Procurement Arrangements and Capacity Assessment.** The procurement activities for the project will be managed by EDM and MIREME. The two agencies have substantial exposure to World Bank procurement requirements as they are managing the ProEnergia (P165453), PERIP (P158249), and Sustainable Energy and Broadband Access in Rural Mozambique (P175295) Projects. The available capacity of EDM and MIREME was reviewed virtually based on the knowledge of the implementing agencies and the following main gaps have been identified requiring enhancements for the day-to-day management of the future project, which includes the (i) availability of qualified procurement personnel,



in a manner satisfactory to the World Bank and (ii) cumbersome internal approval mechanism (Visa for the contracts by the Administrative Tribunal). The action plan below was prepared to mitigate the risks identified.

Table 1.3. Action Plan for Risk Mitigation

Risk Description		Description of Mitigation	Residual Risk
Availability of qualified personnel to support procurement implementation of the projects at EDM and MIREME.		Although EDM and MIREME are familiar in implementing World Bank supported projects, additional qualified personnel will be required under terms satisfactory to the World Bank to support the procurement function of all 4 projects which includes: ProEnergia (P165453), PERIP (P158249), Sustainable Energy and Broadband Access in Rural Mozambique (P175295) and the Green Energy Corridors Project (P179797).	S
Cumbersome internal approval mechanism (Visa to the contracts by the Administrative Tribunal) with significant impact in the implementation of the projects.		Ensure that the packages for internal approvals by the Administrative Tribunal are carefully prepared with a clear checklist of the documents required for approval of the process. Interact more with Administrative Tribunal to learn more on the requirements for submission of the documents for visa.	S

23. Based on the above assessment and mitigating measures, the Residual Procurement Risk associated with the project is substantial.

24. **Review of procurement decisions by the World Bank.** The World Bank exercises its procurement oversight through a risk-based approach comprising prior and post reviews as appropriate. The World Bank sets mandatory thresholds for prior review based on the procurement risk rating of the project. The requirement for a prior- or post-review shall be specified in the procurement plan. The World Bank will carry out post reviews of procurement activities undertaken by the recipients to determine whether they comply with the requirements of the Legal Agreement.

25. **Procurement Manual.** Procurement arrangements, roles and responsibilities, methods, and requirements for carrying out procurement under the proposed project will be elaborated in detail in the procurement manual, which will be a section of the POM.

26. **Bidding process.** The Request for Bids/Request for Proposals document shall require that bidders/proposers present a signed acceptance at the time of bidding, to be incorporated in any resulting contracts, confirming application of, and compliance with, the World Bank’s Anti-Corruption Guidelines, including without limitation the World Bank’s right to sanction and the World Bank’s inspection and audit rights.

Strategy and Approach for Implementation Support

27. **Technical inputs for Component 1.** The finance for the Songo-Cataxa-Matambo transmission segment – which will have a shared PIU with the AfDB, will use its own engineers to execute physical work. Effective preparation of bidding documents and work supervision requires sound technical knowledge. Therefore, the PIUs will engage supervision consultants to strengthen their implementation capacity through Component 1. World Bank staff will support the PIUs to ensure that fiduciary requirements, including FM, procurement, and environmental and social requirements, are met.



Implementation Support Plan and Resources Required

28. Project implementation support will involve the following activities: (i) Up-front technical support to assist the Government on technical approaches and specifications; (ii) At least two regular implementation support missions per year; (iii) Intermediate technical missions, as needed; (iv) Monthly implementation progress reports (physical and financial progress) prepared by the PIUs; and (v) A midterm review around halfway through project implementation to review progress and assess the need for mid-course corrections.

29. The implementation support plan outlined in Table 1.6. indicates the focus areas for implementation support during the initial and subsequent periods of the project. It will be reviewed regularly and updated when required during project implementation.

Table 1.4. Implementation Support Plan

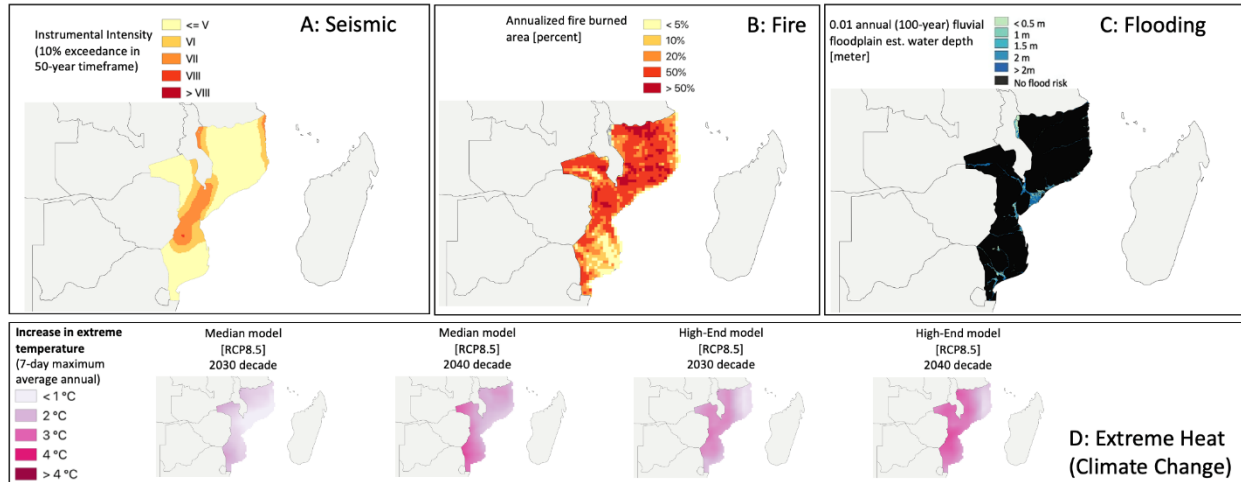
Timeline	Focus
First 48 months	<ul style="list-style-type: none"> • Implementation of transmission investments • Strengthening of PIUs by allocating EDM’ staff that will work exclusively on the project and by hiring consultants to support the EDM’s existing team. • Strengthening of the institutional framework • Strengthening regulatory framework • Implementation of safeguards and FM/procurement system
48–72 months	<ul style="list-style-type: none"> • Technical supervision • Safeguards supervision • Routine FM and procurement reviews • M&E supervision



ANNEX 2: Climate and Hazard Considerations for Phase 1

1. Resilient infrastructure development in Mozambique includes consideration of existing natural hazards³⁴ and ongoing climate change. Relevant risks for this project include wildfire, flooding, earthquake, and extreme heat, which is expected to increase due to climate change. Figure 2.1 details the geographical risks.

Figure 2.1: Key Hazard Risks in Mozambique and their Geographic Distributions.



Data details areas that are at relatively high risks of earthquake (A), wildfires (B), and flooding (0.01-probability annual event) (C). Projected extreme heat map is also shown (D), represented by increases from climate change through the 2030 and 2040 decades of the hottest week of the year.

2. Wildfire and flooding are recognized as a ‘high’ risk in Mozambique¹ under current climate conditions, and climate change is expected to exacerbate these risks³⁵. The wildfire risk is severe everywhere in the country, with some less exposed parts in the south (figure 2.1). Flooding varies geographically and seasonally. Climate change models show that for Mozambique, the current annual probability flood event could significantly increase in frequency³⁶. Seismic motion is a risk to consider in the central part of the country. In most locations, the increase in maximum temperatures over a 7-day average across each decade is approximately 1.5-2°C in the median model for the 2030 decade, while the higher end model shows an increase of 3-4°C.

Resilience ‘of’ and ‘through’ Project Considerations

3. As detailed in its description, the project (Components 1-3) will directly increase the resilience of the power system, making it more efficient and improving the reliability of supply. Given the risks identified in the screening, specific considerations will be given to resilience measures that could help mitigate the impacts of wildfire, flooding, earthquakes, and extreme heat. For example, maintaining the vegetation and using light-duty steel poles in place of wooden poles for transmission systems would decrease the risk of damage by wildfire. Past studies have shown that this might increase

³⁴ ThinkHazard database, Mozambique. The World Bank (2021). <https://www.thinkhazard.org>

³⁵ Liu, Y., Stanturf, J. A., & Goodrick, S. L. (2009). Trends in global wildfire potential in a changing climate. *Forest Ecology and Management* 259:685-697, 259(2010), 685–697. <https://doi.org/10.1016/j.foreco.2009.09.002>

³⁶ Hirabayashi et al, Global flood risk under climate change, *Nature Climate Change*, 3, 816-821, 2013



costs by 4 percent relative to wooden poles,³⁷ and yearly maintenance to manage vegetation would add to this cost. Consideration of aerial bundled cables and application of fire-retardant to all existing wood poles could also be recommended. The most effective method to limit flood impacts is to site infrastructure in location with low flood hazard. Baring this, deep anchor or berms around transmission poles and towers, elevation of substations, and installation of simple floor wall can reduce flood damage. This can be addressed as part of Component 1 of the project with regards to transmission lines in particular. Past studies have shown that elevation of substations can add 7-14 percent to costs.³⁸

4. Extreme heat has impacts on energy demand (cooling for buildings), transmission and distribution efficiency, sagging lines, transformer life, and potential increases to other hazards already a concern in the region, including wildfire risk. Extreme heat reduces the efficiency of transmission lines³⁹ (which can be considered in the planning phase for Component 1) and in photovoltaic panels,⁴⁰ and sagging can increase the likelihood of contact of the lines with unmanaged vegetation. Transformers are also expected to experience a reduction in operating life. Additionally, decreases in generator output with rising temperature is a design consideration which can be compensated for by increasing the size of installed capacity, which is linear in cost. These effects can be addressed in a broader sense through Components 2 and 3 of the project where efficiency losses can be planned for with additional generation capacity. The above mitigation measures will all contribute to the resilience of the project. The increased supply and reliability of electricity will have benefits through the project as will Components 2 and 3, which will aid in long term planning for the power sector and building of institutional capacities.

³⁷ PG&E. 2019. "PG&E 2019 Draft Per Unit Cost Guide." California ISO. www.caiso.com/Documents/PG-E2019DraftPerUnitCostGuide.xlsx

³⁸ Quanta Technology: Cost-Benefit Analysis of the Deployment of Utility Infrastructure Upgrades and Storm Hardening Programs, FINAL REPORT, Public Utility Commission of Texas Project No. 36375, 2009; Thacker,S, S Kelly,R Pant, JW Hall: Evaluating the Benefits of Adaptation of CriticalInfrastructures to Hydrometeorological Risks, Risk Analysis, Vol. 38, 1, 134-150, 2018.

³⁹ Bartos, M, et al.: Impacts of rising air temperatures on electric transmission ampacity and peak electricity load in the United States, Environmental Research Letters, 11, 114008, 2016.

⁴⁰ E Skoplaki, JA Palyvos, "On the temperature dependence of photovoltaic module electrical performance: A review of efficiency/power correlations," Solar Energy, 83, 5, 614-624, 2009.



ANNEX 3: Map of Proposed Transmission Investments under the Program

