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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROGRAM APPRAISAL DOCUMENT

ON A PROPOSED CREDIT
IN THE AMOUNT OF
EUR 281.1 MILLION (US\$300 MILLION EQUIVALENT)

TO THE
REPUBLIC OF CAMEROON

FOR A
CAMEROON POWER SECTOR REFORM PROGRAM

July 13, 2023

Energy and Extractives Global Practice
Western and Central Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2023)

Currency Unit = EURO (EUR); Central
African CFA franc (XAF)

US\$1 = EUR 0.93668040

US\$1 = XAF 614

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

AES	Applied Energy Services Corporation
AER	Rural Electrification Agency (<i>Agence d'Electrification Rurale</i>)
AfDB	African Development Bank
ALUCAM	Aluminum Company of Cameroon (<i>Compagnie Camerounaise d'Aluminium</i>)
AM	Accountability Mechanism
ARSEL	Electricity Sector Regulatory Agency (<i>Agence de Régulation du Secteur de l'Electricité</i>)
AWPB	Annual Work plan and Budget
BIP	Billing Improvement Plan
CAA	Autonomous Amortization Fund (<i>Caisse Autonome d'Amortissement</i>)
CAMWATER	Cameroon Water Utilities Corporation
CELCOR/MINEE	MINEE 's Anti-corruption Unit (<i>Cellule de Lutte contre la Corruption du MINEE</i>)
CESRP	Cameroon Electricity Sector Recovery Plan
CoA	Chamber of Accounts
COLEPS	Cameroon Online E-Procurement System
COVID-19	Coronavirus Disease 2019
CPF	Country Partnership Framework
DA	Designated Account
DLI	Disbursement-Linked Indicator
DLR	Disbursement-Linked Result
DPDC	Dibamba Power Development Corporation
DSA	Debt Sustainability Analysis
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
E&S	Environmental and Social
EDC	Electricity Development Corporation
EMP	Electrification Master Plan
ENEO	Energy of Cameroon S.A
ERR	Economic Rate of Return
ESCP	Environmental and Social Commitment Plan
ESMS	Environmental and Social Management System
ESS	Environmental and Social Standards
ESSA	Environmental and Social System Assessment
ETRP	Electricity Transmission and Reform Project
FDSE	Electricity Sector Development Fund (<i>Fonds de développement du secteur de l'électricité</i>)
FM	Financial Management
GBV	Gender Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GoC	Government of Cameroon
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
HFO	Heavy Fuel Oil



HR	Human Resources
HV	High Voltage
IBRD	International Bank for Reconstruction and Development
ICT	Information and Communications Technology
IDA	International Development Association
IFC	International Finance Corporation
IFSA	Integrated Fiduciary System Assessment
IFR	Interim Financial Report
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPF	Investment Project Financing
IPP	Independent Power Producer
ISC	Inter-ministerial Strategic Committee
ISO	International Organization for Standardization
IT	Information Technology
ITC	Inter-ministerial Technical Committee
IVA	Independent Verification Agency
KPDC	Kribi Power Development Company
KPI	Key Performance Indicator
LV	Low Voltage
M&E	Monitoring and Evaluation
MAR	Maximum Allowed Revenue
MIGA	Multilateral Investment Guarantee Agency
MINEE	Ministry of Water Resources and Energy (<i>Ministère de l'Eau et de l'Énergie</i>)
MINFI	Ministry of Finance (<i>Ministère des Finances</i>)
MoU	Memorandum of Understanding
MV	Medium Voltage
NACC	National Anti-corruption Commission
NDC	Nationally Determined Contribution
NDS-30	National Development Strategy 2020–2030
NEMP	National Electrification Master Plan
NHPC	Nachtigal Hydropower Company
NPV	Net Present Value
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
PAP	Program Action Plan
PASA	Programmatic Advisory Services and Analytics
PDO	Program Development Objective
PEPS	Strengthening Public Sector Effectiveness and Statistical Capacity Project (<i>Projet d'Amélioration de l'Efficacité de la Dépense Publique et du Système Statistique</i>)
PforR	Program for Results
PIP	Performance Improvement Plan
PIU	Program Implementation Unit
POM	Program Operations Manual
PPA	Power Purchase Agreement



PPP	Public-Private Partnership
PROBMIS	Program Budget Management Information System
PSIA	Poverty and Social Impact Assessment
PV	Photovoltaic
RA	Results Area
RFQ	Request for Quotation
RG	Revenue Gap
RIE	Eastern Interconnected Network (<i>Réseau Interconnecté Est</i>)
RIN	Northern Interconnected Network (<i>Réseau Interconnecté Nord</i>)
RIS	Southern Interconnected Network (<i>Réseau Interconnecté Sud</i>)
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SONATREL	National Electricity Transmission Company (<i>Société Nationale de Transport de l'Électricité du Cameroun</i>)
SONEL	National Electricity Company (<i>Société Nationale de l'Électricité</i>)
STEM	Science, Technology, Engineering, and Mathematics
STEP	Systematic Tracking and Exchanges in Procurement
SYFEE	Women's Association for the Energy and Water Sector (<i>Synergie Féminine pour l'Énergie et l'Eau</i>)
ToR	Terms of Reference
TR	Tariff Revenues
TSA	Treasury Single Account
UNFCCC	United Nations Framework Convention on Climate Change
WTP	Willingness to Pay



TABLE OF CONTENTS

DATASHEET.....1

I. STRATEGIC CONTEXT6

A. Country Context.....6

B. Sectoral and Institutional Context.....7

C. Relationship to the CPF and Rationale for Use of Instrument.....14

II. PROGRAM DESCRIPTION.....16

A. Government Program.....16

B. Theory of Change18

C. PforR Program Scope.....20

D. Program Development Objective(s) (PDO) and PDO Level Results Indicators.....25

E. Disbursement Linked Indicators and Verification Protocols26

F. Program Financing30

G. Expenditure Scope30

H. Expenditure Framework31

I. IPF component.....33

III. PROGRAM IMPLEMENTATION34

A. Institutional and Implementation Arrangements.....34

B. Results Monitoring and Evaluation35

C. Disbursement Arrangements36

D. Capacity Building.....36

IV. ASSESSMENT SUMMARY37

A. Technical.....37

B. Fiduciary39

C. Environmental and Social Safeguards.....41

D. Gender.....45

E. Economic Analysis.....45

F. Financial Analysis47

V. RISK47

VI. WORLD BANK GRIEVANCE REDRESS51

ANNEX 1. RESULTS FRAMEWORK MATRIX52

ANNEX 2. DISBURSEMENT LINKED INDICATORS, DISBURSEMENT ARRANGEMENTS AND VERIFICATION PROTOCOLS59

ANNEX 3. TECHNICAL ASSESSMENT72



ANNEX 4. SUMMARY FIDUCIARY SYSTEMS ASSESSMENT	92
ANNEX 5. SUMMARY ENVIRONMENTAL AND SOCIAL SYSTEMS ASSESSMENT	97
ANNEX 6. PROGRAM ACTION PLAN	107
ANNEX 7. IMPLEMENTATION SUPPORT PLAN	111
ANNEX 8. INVESTMENT PROJECT FINANCING COMPONENT	113
ANNEX 9. GENDER	118
ANNEX 10. CLIMATE AND HAZARD CONSIDERATIONS	121



DATASHEET

BASIC INFORMATION

Country(ies)	Project Name		
Cameroon	Cameroon Power Sector Reform Program		
Project ID	Financing Instrument	Does this operation have an IPF component?	Environmental and Social Risk Classification (IPF Component)
P178136	Program-for-Results Financing	Yes	Moderate

Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Contingent Emergency Response Component (CERC)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Small State(s)	<input checked="" type="checkbox"/> Conflict
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Hands-on Enhanced Implementation Support (HEIS)	
Expected Project Approval Date	Expected Closing Date
03-Aug-2023	30-Jun-2028
Bank/IFC Collaboration	Joint Level
Yes	Complementary or Interdependent project requiring active coordination

Proposed Program Development Objective(s)

The Program's Development Objective is to improve financial performance and transparency of the electricity sector, and increase access to electricity in Cameroon.

Organizations

Borrower : Republic of Cameroon

Implementing Agency : Ministry of Water Resources and Energy (MINEE)



Contact: Lionel Omgba Oyono
 Title: Directeur Electricite
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COST & FINANCING

SUMMARY

Government program Cost	1,381.00
Total Operation Cost	945.00
Total Program Cost	925.00
IPF Component	20.00
Total Financing	945.00
Financing Gap	0.00

Financing (USD Millions)

Counterpart Funding	645.00
Borrower/Recipient	645.00
International Development Association (IDA)	300.00
IDA Credit	300.00

IDA Resources (in US\$, Millions)

	Credit Amount	Grant Amount	SML Amount	Total Amount
Cameroon	300.00	0.00	0.00	300.00
National Performance-Based Allocations (PBA)	300.00	0.00	0.00	300.00
Total	300.00	0.00	0.00	300.00

Expected Disbursements (USD Millions)

Fiscal Year	2023	2024	2025	2026	2027	2028



Absolute	0.00	56.00	40.00	80.00	76.00	48.00
Cumulative	0.00	56.00	96.00	176.00	252.00	300.00

INSTITUTIONAL DATA

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Macroeconomics, Trade and Investment

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● High
2. Macroeconomic	● Substantial
3. Sector Strategies and Policies	● High
4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Substantial
8. Stakeholders	● Moderate
9. Other	
10. Overall	● Substantial

COMPLIANCE

Policy

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

Yes No



Does the program require any waivers of Bank policies?

[] Yes [✓] No

Legal Operational Policies

	Triggered
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

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

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Not Currently Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
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 Covenants

Sections and Description



FA, Schedule 2, A.3 (d): The Recipient shall, through the OIU, not later than six (6) months after the Effective Date, hire the Owner's Engineer in accordance with terms of reference and qualifications acceptable to the Association.

Sections and Description

FA, Schedule 2, D.1 (a): The Recipient shall appoint by not later than six (6) months after the Effective Date, and thereafter maintain at all time during the implementation of the Program, one independent verification agent with experience and qualifications and under terms of reference acceptable to the Association (the "Independent Verification Agent"), to: (i) verify the data and other evidence supporting the achievement of the DLIs/DLRs, as set forth in the table in Schedule 3 to this Agreement; and (ii) recommend corresponding disbursements to be made, as applicable, pursuant to such Schedule 3 and Section IV hereinbelow.

Sections and Description

ESCP, ESS 1, 1.1: Establish the OIU, hire or appoint an environmental specialist and a social specialist specialized in stakeholder engagement and SEA/SH by the Effective Date, and thereafter maintain the OIU including these positions throughout Project implementation.

Sections and Description

ESCP, ESS 2, 2.1: Prepare and adopt the LMP within 60 days of Project Effective Date, and thereafter implement the LMP throughout Project implementation.

Sections and Description

ESCP, ESS 10, 10.2: GRM shall be operational prior to Project Effective Date, and thereafter maintained operational throughout Project implementation.

Conditions

Type	Financing source	Description
Effectiveness	IBRD/IDA	FA 4.01 (a): the Recipient has developed and approved the Operational Manual set forth in Section I.B.1 of the Schedule 2 to this Agreement in a manner and substance satisfactory to the Association.
Effectiveness	IBRD/IDA	FA 4.01 (b): the Recipient has established and staffed the Operation Implementing Unit in form and manner, and with resources and terms of reference satisfactory to the Association, in accordance with Section I.A.3 (c) of Schedule 2 to this Agreement.



I. STRATEGIC CONTEXT

A. Country Context

1. **Cameroon is a lower-middle-income country located in the Central part of Sub-Saharan Africa along the Atlantic Ocean.** It has a surface of 475,440 km² and a population of almost 27.9 million¹. It is the largest economy in Central Africa, with a gross domestic product (GDP) per capita of US\$1,588.5², and vast natural resources such as oil, gas, minerals, agricultural land, and forests. In the last decade, the population rose by 2.5 percent per year, with an average density of 56.2 person per square km of land area³, although with a much higher density in large urban centers (Douala, Yaoundé, and Garoua) and in the Western and Northern regions. The country is also facing a security crisis in the Northwest and Southwest regions as a result of socio-political problems, on the one hand, and in the Far North region, which has been affected by attacks by the Boko-Haram terrorist sect, therefore inhibiting economic activity. The country experiences security incidents in the Far North region near Lake Chad, in the northwest and southwest regions near the western border with Nigeria and an inflow of refugees near the East and Adamawa regions along its border with Central African Republic.

2. **Cameroon has weak social indicators and has been negatively affected by the coronavirus disease 2019 (COVID-19) pandemic.** Poverty remains high in the country with around 24.3 percent of the population (25.0 percent of women) in 2022 living in extreme poverty driven by the widening inequality in rural areas. The COVID-19 crisis has increased the poverty rate by 0.82 percentage points, reversing much of the progress in poverty reduction achieved in recent years. Cameroon ranks 153 out of 189 countries on the Human Development Index with a value of 0.563.⁴ The country also performs low, below the Sub-Saharan average, in the Gender Inequality Index.⁵ In Cameroon gender equality progressed slightly, although relevant gender gaps and disparities exist between rural and urban areas. The country recognizes the importance of women's empowerment for its intrinsic value and for its contribution to economic development. Overall labor force participation has remained steady in since 2010, with increasing women participation. Unemployment and informality remain, although higher for women.

3. **While Cameroon is highly vulnerable to climate change, it is a low contributor to greenhouse gas (GHG) emissions.** Cameroon accounts for 0.42 percent of global emissions but is ranked 146 out of 188 in terms of its vulnerability and readiness to climate change impacts. An increase in the frequency and severity of extreme weather events would inflict a heavy toll in human lives and welfare, with a high risk of damage to the country's scarce and valuable human and natural capital. In addition, average annual temperature is projected to rise by over 2°C by mid-century. Cameroon is highly vulnerable to river, urban, and coastal floods, landslides, volcano, water scarcity, extreme heat and wildfires⁶. The poorest, marginalized, and most vulnerable households and communities will be hit the hardest, as income and health shocks will drive them deeper into poverty. Hydropower production in Cameroon is fairly resilient to climate-related shocks according to its recent Country Climate and Development Report, yet infrastructure assets, including electricity transmission and distribution networks, remain vulnerable to

¹ World Bank Data (2022) <https://data.worldbank.org/country/CM>

² World Bank Data (2022) <https://data.worldbank.org/country/CM>

³ World Bank Estimates

⁴ United Nations Development Programme 2020. <https://hdr.undp.org/sites/default/files/Country-Profiles/CMR.pdf>.

⁵ Cameroon ranked 141 out of 162 countries on the Gender Inequality Index.

⁶ <https://thinkhazard.org/en/report/45-cameroon>



climate hazards with a potential cost of disruption of about 1.16 percent of GDP in 2019.⁷ Russia's invasion of Ukraine has accentuated the inflation, impacting the prices of agricultural and non-agricultural products in Cameroon. The situation is leading to price hikes not only on key commodities such as wheat, maize, but also fuel and fertilizer. These hikes could have major implications for food security in Cameroon, and especially in the Far North region where the combination of climatic factors, intercommunity clashes, and insecurity were already causing harmful consequences.

4. **Cameroon's economy continued expanding in 2022, after growing by 3.6 percent in 2021, although at a slower pace.** Real GDP growth reached 3.5 percent in 2022⁸ supported, on the supply side by liquefied natural gas exports, agri-food industries, construction, and services. However, households' consumption and private investment shrank substantially amid sustained high inflation and tightening global financial conditions. Inflationary pressures were further amplified, hiking by 7.6 percent year-on-year at the end of September 2022⁹, driven by soaring food prices. Domestic energy prices remained contained amid large fuel subsidies by the Government (about US\$1 billion for 2022)¹⁰. The fiscal deficit is expected to have dropped to 1.8 percent in 2022, as the Government cut capital expenditures and delayed some current expenditures to accommodate for higher fuel subsidies. Inflation was 6.3 percent in 2022 but should remain below 3.0 percent in the medium term, reflecting the results of monetary policy tightening. Cameroon remains at high risk of debt distress, although its public debt is assessed as sustainable over the medium term.¹¹ The overall debt sustainability indicators have deteriorated somewhat compared to the previous Debt Sustainability Analysis (DSA) of July 2022, mainly due to a weaker exchange rate. The public debt stock is projected to increase to 46.5 percent of GDP in 2022 from 45.6 percent of GDP at end-2021.

5. **The National Development Strategy 2020–2030 ('NDS-30') identifies the need for fiscal consolidation and structural reforms, including in the electricity sector, to promote inclusive growth and economic development.** NDS-30, launched in 2020 by the Government of Cameroon (GoC), acknowledges the central role of the electricity sector to achieve the country's industrialization objectives. In addition, NDS-30 aims to improve access to basic social services, strengthen climate change adaptation and mitigate the effects of climate change, and improve the country's governance to achieve development goals. Against the backdrop of increased fiscal consolidation, the GoC is focused on key reforms to improve financial sustainability of the electricity sector to reduce its impact on fiscal deficit of the sector.

B. Sectoral and Institutional Context

6. **Over the last 20 years, the GoC has spearheaded a series of structural reforms to improve sector efficiency and attract private investments in the electricity sector.** In 2001, the vertically integrated public utility National Electricity Company (*Société Nationale d'Electricité*, SONEL) was privatized,

⁷ Estimated cost of disruption to the power sector, World Bank's Lifelines Report 2019.

⁸ World Bank Data (2022) <https://data.worldbank.org/country/CM>

⁹ World Bank estimates

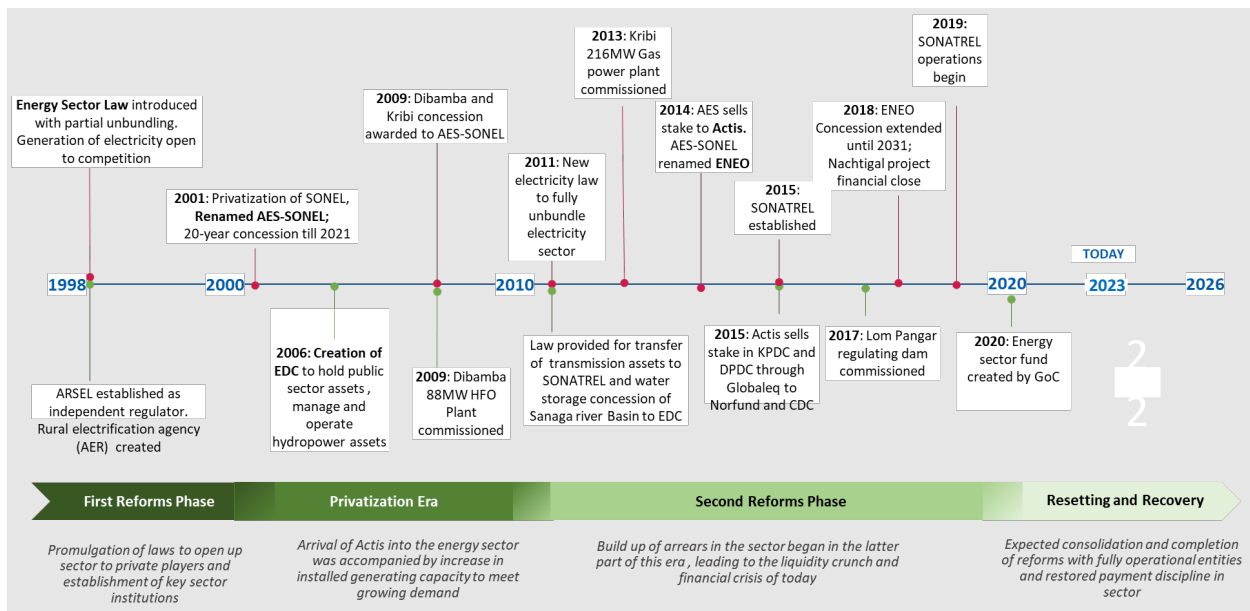
¹⁰ In February 2023, the Government of Cameroon increased retail fuel prices to reduce level of subsidies to the economy.

¹¹ International Monetary Fund (IMF)-World Bank Debt Sustainability Analysis-DSA, February 2023.



becoming AES-SONEL.¹² The utility became a concessionaire responsible for operating the generation,¹³ transmission, system operation, distribution, and retail segments. In 2011, the GoC enacted the New Electricity Law, which introduced key reforms, including (a) unbundling of the transmission sub-sector from the scope of the concession due to the inability of the concessionaire to fulfill its contractual obligations in the transmission segment and transferring of the transmission and system operation activities to a state-owned national electricity transmission company (*Société Nationale de Transport de l'Électricité du Cameroun, SONATREL*)¹⁴; (b) new governance arrangements for water storage, including the transfer of the water storage concession of the Sanaga Basin reservoir to a dedicated state-owned company, the Electricity Development Corporation (EDC); and (c) a new tariff regime. In 2014, the British-owned private equity firm Actis became the majority shareholder of AES-SONEL, and the company was renamed Energy of Cameroon S.A or ENEO, in charge of the development of the generation, distribution, and retail segments (see Figure 1).

Figure 1. History of Reforms in the Cameroonian Power Sector



7. **The World Bank has played a critical role in the achievement of key milestones in the overall reform pathway of the energy sector of Cameroon.** The World Bank supported the construction of the Lom Pangar¹⁵ regulating dam upstream of the Sanaga River, which paved the way for the country to maximize its hydropower potential through the generation of affordable, clean, low-cost energy from hydroelectric sources. The existence of Lom Pangar supported the development of the private sector-led Nachtigal¹⁶ hydropower (420 MW) plant which expected to contribute thirty percent of the overall

¹² The State sold 56 percent of its shares and granted a 20-year concession to the Applied Energy Services Corporation (AES).

¹³ In 1998, the GoC opened the generation segment to competition, which allowed the commissioning of two IPPs a decade later: 88 MW heavy fuel oil (HFO) Dibamba Power Plant (2009) and 216 MW Gas Kribi Power Plant (2013), both majority-owned by Globeleq in partnership with the GoC.

¹⁴ SONATREL was created in 2015 and became operational in 2019.

¹⁵ Lom Pangar Hydropower Plant Project (P114077) closed in 2019.

¹⁶ Nachtigal Hydropower Project (P157734) approved in 2018.



generation capacity of the sector upon commissioning in 2024. The current World Bank engagement in Cameroon encompasses a large portfolio of investments and technical assistance with approximately US\$1.1 billion of commitments. The World Bank Group's engagement spans all subsectors, including (a) rural electrification;¹⁷ (b) hydropower development, and technical assistance¹⁸ to support hydropower development; (c) transmission segment, mainly by supporting the creation of SONATREL following the unbundling reform, and providing financing for the expansion of the transmission network;¹⁹ and (d) regional integration²⁰ to enable connection of the country's southern and northern transmission networks and provision of the first transmission backbone to the Central African Power Pool. Through its programmatic advisory services and analytics (PASA),²¹ the World Bank supports the GoC in identifying and addressing the critical issues hindering the overall performance of the sector. The performance of the portfolio has historically been average due to varying challenges, notably the prolonged governmental approval process of compensation of project-affected persons due to resettlement. Nevertheless, the GoC continues to make significant efforts with the World Bank's support to improve the performance of the portfolio through proactive actions to accelerate project implementation.

8. **Past Government-led sector reforms supported by the World Bank Group provided lessons on the need for sustained technical and financial support during an extended period.** Thus, a Development Policy Operation series,²² aimed at supporting the Government in setting key performance indicators (KPIs) in ENEO's concession contract and in clearing sector arrears to improve its short-term financial viability, did not lead to significant improvements in the operational performance and financial viability of the sector, as arrears were reaccumulated in subsequent years. Key lessons learned from such engagement includes the need for (a) deep reforms that address the root cause of unpaid invoices by the GoC such as inadequate metering and estimated billing, which leads to delays in payment of electricity bills; (b) an incentive-based instrument such as the Program for Results (PforR), which provides support to a results-based government program and over a longer period, as opposed to a single up-front disbursement; and (c) technical assistance that provides ongoing support to the Government throughout the reform process.

¹⁷ Rural Electricity Access Project for Underserved Regions (P163881) and Energy Sector Development Project (P104456) (closed).

¹⁸ Hydropower Development on the Sanaga River Basin Technical Assistance Project (P157733).

¹⁹ Electricity Transmission and Reform Project (ETRP, P152755). Financing was approved in 2016.

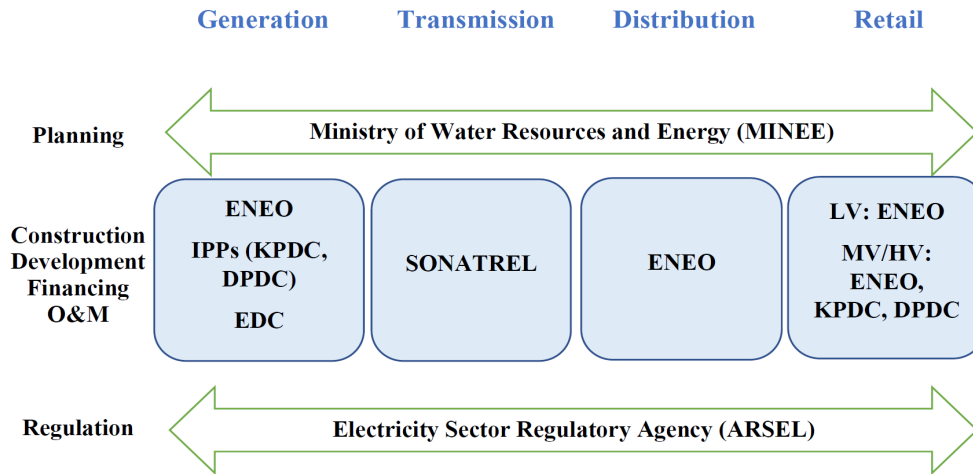
²⁰ Cameroon-Chad Interconnector Project (P168185). Financing was approved in 2020.

²¹ Cameroon Energy Sector PASA (P174960), which has delivered a Cost-of-Service Study and an Electricity Access Diagnostic study to accelerate the country's electrification.

²² Fiscal consolidation and inclusive growth Development Policy Financing series (P163657, P166694, and P168332 approved on December 20, 2017, August 28, 2019, and April 19, 2021, respectively).



Figure 2. Institutional Structure of Cameroon’s Electricity Sector



Note: KPDC = Kribi Power Development Company; DPDC = Dibamba Power Development Corporation; HV = High voltage; IPPs = Independent power producers; LV = Low voltage; MV = Medium voltage; O&M = Operation and maintenance.

9. Private sector participation is expected to be increasingly important in the Cameroonian electricity sector. Private sector investments delivered the 216 MW gas-fired Kribi power plant and 88 MW HFO Dibamba power plant and are expected to deliver the upcoming 420 MW Nachtigal²³ hydropower plant, which is one of the few public-private partnerships (PPPs) in hydropower in Sub-Saharan Africa. Furthermore, the World Bank, the Multilateral Investment Guarantee Agency (MIGA) and the International Finance Corporation (IFC) have provided risk mitigation, insurance, and debt and equity for these private sector-led projects.

10. In 2022, around 74 percent of energy produced from the country’s 1,500 MW available installed generation capacity came from hydropower sources; however, 26 percent of the annual production was from thermal due to wide variations in hydrology from year to year and inadequate transmission infrastructure. Despite its huge hydropower potential, which is mostly concentrated in the Sanaga River (southern part of the country), the entire population does not benefit from the supply of cheap renewable energy because of the limited exploitation of the resource and absence of a single integrated transmission network. The transmission infrastructure of Cameroon was historically divided into three independent networks; Southern Interconnected Network (*Réseau Interconnecté Sud*, RIS), Northern Interconnected Network (*Réseau Interconnecté Nord*, RIN), and Eastern Interconnected Network (*Réseau Interconnecté Est*, RIE)—covering the southern, northern, and eastern regions, respectively. The power system also has smaller decentralized distribution networks served by isolated thermal plants (approximately 42 MW in total). In December 2022, two of the three main transmission networks were interconnected (RIS-RIE). The interconnection of the southern and eastern regions allows for the

²³ US\$1.4 billion project is financed by a group of 14 DFI lenders including 10 DFIs (IFC, European Investment Bank, African Development Bank [AfDB], Africa Finance Corporation, Proparco, *Agence Française de Développement* [AFD], German Investment and Development Corporation [DEG], Emerging Africa Infrastructure Fund, Dutch Entrepreneurial Development Bank [FMO] and British International Investment) and four local commercial banks. Financial close was reached in December 2018 and construction activities began in February 2019. The World Bank (International Bank for Reconstruction and Development [IBRD]) provides a US\$300 million partial risk guarantee to the project while MIGA provides a political risk insurance to cover EDF and STOA’s equity investments.



transmission of up to 500 MW of electricity to the eastern part of Cameroon and savings of up to XAF 12 billion²⁴ (approximately US\$20 million) a year, as it allowed the decommissioning of the thermal plant in the eastern region (Bertoua). The implementation of the World Bank-financed Cameroon-Chad Interconnection Project (P168185) will allow the low-cost energy from the south to be transported to the energy starved north from 2026 onward and reduce the fuel consumption of expensive thermal sources of generation, which can be significant²⁵ in periods of low hydrology in the north, creating severe financial impacts that can be exacerbated by high global oil prices.

11. **Despite reform efforts and huge hydropower potential, significant challenges remain in the electricity sector such as inadequate planning with uneven access rates linked to insufficient distribution and transmission infrastructure.** Electricity access rate in Cameroon stands at 65 percent²⁶ with significant disparities between urban (94 percent) and rural (25 percent) areas. The GoC aims to achieve a 90 percent access rate by 2030 according to its NDS-30. However, several barriers remain to achieve this goal: (a) inadequate planning and multiplicity of stakeholders implementing access projects without clear roles and boundaries; (b) absence of modern tools, for example, a centralized georeferenced database to monitor progress; (c) delays in project implementation as a result of low levels of readiness; and (d) poor maintenance of the distribution network.²⁷ The Program under preparation will support the incorporation of crucial planning tools, such as an Electrification Master Plan (EMP) and a Power System Master Plan.

12. **The electricity sector in Cameroon is not entirely financially self-sufficient and is subsidized by the Government with associated fiscal impacts on its budget.** For 2022, the Government’s subsidy to the sector (known as tariff compensation) represented 1.7 percent of the total annual budget compared to 0.3 percent budgeted for the social sector and 17.0 percent²⁸ on fuel subsidies. Overall, budgeted expenditures in the electricity sector in 2023 represent 5 percent of the total budget.

Table 1. Electricity Sector-Related Expenditures in the Annual Budget

	XAF, millions		US\$, millions	
	2022	2023	2022	2023
MINEE (energy access and supply)	188,792	212,432	305	343
Electricity Sector Development Fund (<i>Fonds de développement du secteur de l'électricité</i> , FDSE)	13,000	15,000	21	24
Tariff compensation to households	53,995	5,000	87	8
Energy-related expenditures in budget	255,786	232,432	413	375
Total budget	4,548,000	4,905,000	7,347	7,924
<i>% of Total budget</i>	6	5	6	5

13. **Poor operational performance in transmission and distribution, coupled with lack of payment discipline of subsidies and bills by public agencies and weak sector regulation, have hampered the financial viability of the electricity sector in Cameroon.** Technical and non-technical losses in the

²⁴ Source: MINEE. 2022. *Brochure pour la ceremonie officielle de l'interconnexion RIS-RIE*.

²⁵ For 2021 and 2022, fuel costs in sector were on average XAF 80 billion (US\$130 million), which was double the amount in 2020 (XAF 40 billion or approximately US\$65 million).

²⁶ Source: Tracking SDG7 2020 data.

²⁷ As identified in the World Bank Cameroon Energy Sector PASA.

²⁸ Source: Ministry of Finance (MINFI).



distribution sector total on average 27 percent²⁹ and, despite an improvement over the regulatory allowance of 29 percent³⁰ under its agreed KPIs, remain a key indicator of the ENEO’s poor operational performance. In 2022, average end user tariffs³¹ in Cameroon were US\$0.14 per kWh (XAF 81 per kWh) compared to a cost of service of US\$0.17 per kWh (XAF 99 per kWh), heavily affected by a combination of high prices of oil products and poor hydrology. The cost of service in Cameroon is sensitive to the hydrological conditions in the northern part of the country where thermal energy is being used to meet demand when hydrology is low. Electricity tariffs in Cameroon have been frozen from 2012 until the end of 2022. Even though the sector regulator Electricity Sector Regulatory Agency (*Agence de Régulation du Secteur de l’Electricité*, ARSEL) sets maximum allowed revenue (MAR) of regulated companies across the value chain on an annual basis and methodologies for that purpose are revised every five years, the GoC chooses to pay tariff compensation or subsidies equal to the amount of difference between cost of service (total MAR) and tariff revenues. Given the variability in Cameroon’s electricity generation mix, values of tariff compensations change from year to year. In a year of average hydrology and with current prices of oil products, the average tariff is around 90 percent of cost-reflective level set by regulation, which contemplates a high allowance on losses.

Table 2. Historical Tariff Compensation Payments from the GoC to the Energy Sector

	2016	2017	2018	2019	2020	2021	2022	2023*
<i>XAF billion</i>	11.0	6.9	-12.7	45.3	3.8	54.4	75.4	29.4
<i>US\$ million</i>	17.8	11.2	-20.4	73.2	6.1	87.9	121.9	47.5
<i>% Annual budget</i>	0.3%	0.2%	-0.3%	1.0%	0.1%	1.3%	1.7%	0.6%
<i>% GDP</i>	0.1%	0.0%	-0.1%	0.2%	0.02%	0.2%	0.3%	0.1%

Note: *2023 figures forecasted values.

14. **The World Bank supported the preparation of a cost-of-service study under the ongoing PASA, which informed the tariff reform actions to be taken by the regulator.** Consistent with outcomes of the study, the GoC has begun the tariff reform process to bring MV and HV customers to the right tariff levels (cost of service), keeping subsidies applied to LV customers. Projections made in the cost-of-service study under a series of assumptions for demand and costs show that from 2027 onward, and under normal hydrological conditions, the tariff deficit in the sector could be eliminated as generation costs are reduced due to the incorporation of cheaper hydropower from Nachtigal hydropower plant, the interconnection of the RIS-RIN, and the installation of solar photovoltaic (PV) generation in isolated systems currently running on diesel-based thermal generation. In the meantime, subsidies to the sector are expected to show a gradual decline, as the GoC perceives there is limited room for tariff increases for residential consumers.

15. **ENEO’s mediocre performance in revenue collection combined with absence of discipline in the payment of electricity invoices of public agencies and delay in payment of compensation by the GoC have contributed to a liquidity crisis in the electricity sector.** On average, it takes ENEO 6.5 months to collect payments from its clients and in turn, ENEO delays payments to its energy providers (private sector IPPs: Kribi Power Development Company [KPDC], DPDC, and state-owned EDC), fuel suppliers, and transmission company (SONATREL). Sales to government administration and state-owned companies (including the aluminum smelter Aluminum Company of Cameroon [*Compagnie Camerounaise*

²⁹ Source: ARSEL, 2021 estimate.

³⁰ Source: ARSEL, ENEO KPIs.

³¹ Tariff for regulated LV and MV customers in 2021.



d’Aluminium, ALUCAM] and the Cameroon Water Utilities Corporation [CAMWATER]) represent about 20 percent of ENEO’s monthly billing of XAF 6.9 billion³² or US\$11.2 million equivalent (excluding compensation) and only about 30 percent of monthly amounts billed are paid on time. This has resulted in an accumulation of cross arrears in the sector. In December 2021, ahead of the African Cup of Nations, which was hosted by Cameroon, the liquidity crunch situation reached a peak. The GoC subsequently announced an injection of XAF 182 billion (US\$296 million equivalent) into the sector to settle arrears and prepay part of the tariff compensation amounts for 2022. The injection was completed three months later through a combination of financial arrangements—receivables factoring with commercial banks and raising domestic debt obligations in the regional market. By August 2022, the arrears had built up once again in the sector, with ENEO claiming XAF 168 million in arrears (US\$274 million equivalent) even though only XAF 42 billion (US\$68 million equivalent) was uncontested and under settlement by the GoC. There is a repeated vicious cycle of lack of accuracy in billing of public agencies (absence of meters at every consumption point), delay in payments by the GoC, arrears build-up, liquidity crunch, and ad hoc ‘bailout’ by the GoC, which creates an unsustainable situation that needs to be drastically changed. Improving the transparency in the billing invoices of government administration buildings and public lighting through the installation of smart meters will facilitate timely payments by the GoC. The introduction of energy efficiency measures will also help reduce the overall cost of electricity consumption for the GoC.

Table 3. Historical Cross Arrears Situation in the Sector

End of year estimates in US\$ million	2019	2020	2021	2022*
GoC arrears to ENEO	189.2	204.7	204.5	101.0
SOEs arrears to ENEO	96.5	112.5	122.0	54.2
ENEO arrears to SOEs	206.5	242.5	154.0	134.0
ENEO arrears to private sector	147.3	201.2	182.3	131.7

Source: World Bank estimates using ENEO and MINFI data.

Note: *Under reconciliation.

16. **ENEO’s way forward needs to adhere to the principles of transparency and efficiency.** ENEO is likely to undergo profound changes in 2023 that will have an impact on its shareholding structure. The British private equity firm Actis, the majority shareholder, is seeking an exit and has been exploring potential buyers of its shares, including private companies and pension funds. The World Bank as part of its ongoing dialogue with the government of Cameroon has expressed the need for a transparent buy-out process that is based on a complete due diligence carried out by experts. Moving forward, a governance structure that allows for increased sector managerial efficiency is expected to be put in place. The proposed program will play an important role in improving financial performance of the energy sector (through *inter alia*, tariff revisions for certain categories of consumers and improvement of payment discipline), improving transparency (through regulatory audits of sector operators) and increasing access to electricity in Cameroon. These are essential elements for a thriving distribution segment regardless of its ownership and governance structure. Given the critical role of the distribution segment in the overall performance of the sector, the proposed program will also support investments in distribution.

17. **The arrival of energy from Nachtigal in 2024 will be a game changer in the electricity sector given its expected contribution to the generation mix.**³³ The incorporation of this low-cost source of

³² ENEO estimates August 2022.

³³ 30 percent of generation.



hydroelectricity to the generation mix would have the impact of lowering the average cost of energy generation. However, significant investments needed for the transmission and distribution of energy from Nachtigal have been delayed due to inadequate sector planning. Under the ETRP, the World Bank is financing the construction of one substation and three transmission lines necessary for the evacuation of energy from Nachtigal. Nachtigal will be the third IPP in the sector, and its power purchase agreement (PPA) with ENEO is designed as a take-or-pay contract. Any inability to connect the supply of energy from the plant to demand coupled with the associated fixed charges in the PPA is likely to have a negative impact on the financial sustainability of the sector in the short term until key infrastructure such as RIS-RIN is completed. Poor payment discipline and accumulation of arrears would only exacerbate the fragile sector situation. This emphasizes the need for structural reforms in tariff regulation, sector planning for timely investments, and good payment discipline.

18. **The proposed Program will play a key role in achieving the Government’s overall sector objectives to address current challenges.** While the electricity generation deficit will be addressed by the upcoming commissioning of the Nachtigal hydropower project, the proposed Program will reduce the burden of the US\$180 million annual fixed charges arising from the project by removing grid bottlenecks to increase ENEO’s sales to industrial customers³⁴. In a context of high oil prices, the proposed Program will contribute to reduce the fiscal impacts of subsidy payments for fossil fuels through the hybridization of thermal plants with solar PV³⁵. The recurrent cycle of mounting arrears from public sector to ENEO, with spillover effects to private IPPs, will also be addressed by the proposed Program by ensuring timely payments by MINFI through DLI 2. Overall, the government strategy for turning around the sector is outlined in the seven priority axes to be addressed in the government program described in subsequent sections.

C. Relationship to the CPF and Rationale for Use of Instrument

19. **The World Bank Group Country Partnership Framework (CPF) for Cameroon FY17-21³⁶ provides the overarching framework for this operation.** The CPF is based on the priorities identified in the Systematic Country Diagnostic and is aligned with the Government’s program. The CPF focuses on three strategic pillars: (a) addressing multiple poverty traps in rural areas; (b) fostering infrastructure and private sector development; and (c) improving governance. The proposed operation will support all three pillars of the CPF by improving access to electricity, thereby increasing productivity in rural areas according to the first pillar of the CPF. Efforts to enhance the sector’s financial viability through reforms will attract greater private sector participation in the electricity sector according to the second pillar. Reform actions under the program to increase transparency in the operations of the sector will contribute to improving governance of operators. Overall, the CPF recognizes the importance of the energy sector in providing reliable and quality electricity supply to improve the business environment, transform the economy, and promote private sector-led growth. This would further support Cameroon’s goal of attaining higher-middle-income status by 2035.

20. **The proposed PforR is aligned with the World Bank Group’s Gender Strategy.** The 2016–2023 World Bank Group Gender Strategy underlines key gender gaps and promotion of gender equality.

³⁴ DLI7.

³⁵ DLI6.

³⁶ Report No. 107896-CM, discussed by the World Bank Group Board of Executive Directors on March 28, 2017. The CPF for FY24–FY27 (P500057) is currently under preparation.



Particularly, it emphasizes the access to services and the promotion of employment and economic opportunities in the energy sector, removing constraints toward increasing women's participation in the labor market including in science, technology, engineering, and mathematics (STEM) fields and enhancing women's voice and agency through strategically supporting women participation in related positions. Specifically, the PforR will include targeted interventions to improve women's employment in the energy sector by promoting their access to technical internships at key energy sector institutions and facilitating their subsequent access to jobs within the sector, for example, through targeted mentoring. Given that gender-focused interventions are also embedded in the Cameroon-Chad Interconnector Project (P168185), Rural Electricity Access Project for Underserved Regions (P163881), and Regional Off-Grid Electrification Access Project (P160708), actions will build upon relevant interventions within these projects and will seek complementarities and efficient uptake of lessons learned wherever possible.

21. **Given the GoC's commitment to address the root causes of the power sector's underperformance affecting the daily lives of Cameroonians, the PforR instrument has been identified as the most relevant to incentivize and sustain implementation of structural sector wide reforms.** The proposed PforR, the first for the GoC, comes at a critical juncture in the country's energy sector where key reforms are required to alleviate the fiscal burden of inadequate tariff regulation, improve sector financial viability, and strengthen institutional capacity to increase electricity access. Through disbursement-linked indicators (DLIs), the PforR instrument provides incentives for the implementation of critical reforms, as defined by the GoC in the Cameroon Electricity Sector Recovery Plan (CESRP). The PforR framework strengthens the focus on results, institutional accountability, and payment discipline throughout the sector value chain. Furthermore, the instrument also provides some flexibility for scalability of project activities where necessary, such as with electricity access-related activities. The Investment Project Financing (IPF) component under the proposed operation will finance technical assistance and capacity building that will further strengthen policy framework and project management capacity as well as support improving the participation of women in technical positions within the energy sector.

22. **The PforR plays an important role in providing an enabling environment for sustainable private sector participation in Cameroon's energy sector (Private Capital Enabling).** The PforR will complement the World Bank's ongoing operations in Cameroon's electricity sector, in that both the reforms to be supported and performance incentives will help enhance private capital mobilization through the Maximizing Financing for Development approach as a result of improved sector liquidity and confidence in the sector by private sector. The project will help address key systematic issues facing the power sector, which presents one of the major constraints to private investments and hinders development of the energy sector. The PforR will strengthen ENEO's creditworthiness and reduce its off-taker risk under existing PPAs with IPPs in the sector, including the Nachtigal Hydropower Company (NHPC), by supporting increase in sector revenues and payment discipline, enhancing ENEO's accountability in achieving key performance improvement targets, and building trust within the energy sector. The PforR would further support private capital mobilization in distribution as its DLIs support the increased performance of ENEO by strengthening the oversight of its concession contract by the regulator. In generation, the PforR will also attract additional private capital for additional IPP projects in the GoC's pipeline and private sector-led solar PV projects. The World Bank will continue to collaborate closely with IFC and MIGA to ensure that the World Bank Group interventions are well-coordinated, complementary and support sustained improvements in sector performance, thereby strengthening private sector confidence in the Cameroonian power sector.



23. **The project is consistent with Cameroon’s Nationally Determined Contribution (NDC)³⁷ and National Adaptation Plan.³⁸** In the revised NDC, as of October 2021, submitted to the United Nations Framework Convention on Climate Change (UNFCCC), Cameroon has increased its mitigation targets to 35 percent by 2030 compared to 2010, including an unconditional contribution of 12 percent.³⁹ The project contributes to the NDC by improving financial sustainability of the energy sector, reducing technical losses, increasing access to modern and clean energy, and improving overall efficiency of the power system. All of these objectives will feed into reduction of GHG emissions. Therefore, it can be inferred that the project is consistent and aligned with Cameroon’s NDC and long-term plans. According to the findings of the Cameroon Country Climate and Development Report, the quality of access to basic service needs to be improved; this project is likely to increase the resilience of the communities, households, and institutions that will benefit from increased access to electricity. The project is also consistent with the energy sector measures put forward in Cameroon’s National Adaptation Plan⁴⁰. Thus, it will support the diversification of energy sources and the development of renewable energies⁴¹ due to the extension of the hydro-dominated distribution grid to increase electricity access and the hybridization of thermal plants with solar photovoltaic.

II. PROGRAM DESCRIPTION

A. Government Program

24. **In line with the objectives of NDS-30, the GoC has elaborated its CESRP 2023–2027 to implement reforms that will address the challenges faced by the sector.** The CESRP encompasses the following seven priority areas: (a) a greener electricity generation mix; (b) a resilient transmission grid; (c) a financially sustainable sector; (d) a well-performing operator; (e) an increased access to electricity; (f) an expanded industrial load; and (g) a skilled local workforce. The CESRP’s estimated cost over the next four years is XAF 850 billion (US\$1.38 billion equivalent). The GoC expects implementation of the CESRP to improve the operational and financial viability of the sector; reduce thermal pollution as the sector transitions to more renewable sources of energy; enhance the quality of life of the population as more Cameroonians will have access to affordable, reliable, and clean energy in the long term; and contribute to the industrialization and economic growth of the country as the electricity sector reforms boosts industrial production.

25. **To make the electricity generation mix greener, the Government plans to increase hydropower generation to 85 percent and variable renewable energy to 5 percent and phase out diesel for power generation to achieve a total installed capacity of 5,000 MW by 2030.** To enable the increased penetration of variable renewable energies, the GoC expects to increase the generation of electricity from natural gas to 10 percent. Based on a PPP model, the GoC intends to develop the hydropotential of the Sanaga River Basin, including the 420 MW Nachtigal project under construction and the 560 MW Kikot project. In the northern regions, the GoC plans to develop several solar PV plants with a total installed capacity of 250 MW.

³⁷ <https://unfccc.int/sites/default/files/NDC/2022-06/CDN%20r%C3%A9vis%C3%A9e%20CMR%20finale%20sept%202021.pdf>

³⁸ https://www4.unfccc.int/sites/NAPC/Documents/Parties/PNACC_Cameroon_VF_Valid%C3%A9e_24062015%20-%20FINAL.pdf

³⁹ <https://climatepromise.undp.org/what-we-do/where-we-work/cameroon>

⁴⁰ <https://www4.unfccc.int/sites/NAPC/Pages/national-adaptation-plans.aspx>

⁴¹ Measure 6.5 of Cameroon’s National Adaption Plan, June 24, 2015.



26. **To strengthen the transmission grid, the Government aims to develop a unified and redundant transmission network to improve the quality of supply in the largest cities to spur industrial development and exports.** On November 19, 2022, the commissioning of a 225 kV line connected two of the three isolated transmission networks in the country (RIE and RIS). The GoC expects the unified national network to become a reality by 2027 with the connection of RIN with RIS through the World Bank-financed Cameroon-Chad Interconnection Project (P168185). This project will expand the transmission network and enable power exports to Chad and Nigeria. To increase security of supply and industrial electricity consumption, the development of network redundancies to mitigate contingencies is a priority.

27. **To achieve financial sustainability, the Government intends to adjust tariffs to certain consumer categories after a decade-long tariff freeze, reduce tariff subsidies ('compensation'), and improve public sector payment of electricity consumption.** Decreased hydrologic conditions, due to climate variability and change, led sector operators to turn to expensive thermal-based generation to ensure supply-demand balance. The GoC subsidized the costs to mitigate the impact on consumers. However, subsidies will be significantly reduced to ensure cost-reflective tariffs, in line with article 88 of the Electricity Law 2011/022. In addition, the reduction of total losses in the distribution network to 10 percent by 2031 through a nationwide anti-fraud program and key investments implemented by the private distribution operator, ENEO. The GoC also plans to address the nonpayment of electricity consumption by the public sector, including public lighting, through the rollout of smart meters to public buildings to improve the reliability of meter reading and optimize consumption.

28. **To improve the operational performance of sector operators, the Government proposes to strengthen the regulatory oversight and monitoring of investments, particularly from ENEO.** The regulator, ARSEL, is expected to carry out audits on the performance reports of sector operators, as well as the monitoring and verification of key investments. MINEE is expected to enhance the monitoring of the concession of sector operators through specialized committees to be created.

29. **To increase access to electricity, the Government proposes to extend the LV/MV grid to bridge the large urban-rural access gap with the financial support of the FDSE and several donor-funded projects, including the World Bank.** To achieve universal electricity access, the GoC plans to carry out the following actions: (a) development of an EMP comprising grid extension, mini-grids, and stand-alone systems; (b) rehabilitation and strengthening of existing networks; (c) development of a smart network; and (d) organization of a donor roundtable to secure financing for the EMP implementation.

30. **To increase electricity demand from industrial customers, the Government intends to implement a set of measures to incentivize industries currently relying on expensive self-generation to connect to the national electricity grid.** MINEE identified a potential industrial demand of 450 MW in Douala in addition to a number of industries in the Port Authority of Kribi pending their connection to the grid to kick off their commercial activities. The Government's planned measures include (a) capacity increase of HV substations and the rehabilitation of HV lines; (b) construction of a set of dedicated MV lines for industrial customers; (c) adoption of attractive time-of-use rates for industries; and (d) monitoring and annual publication of quality-of-service indicators for industries.

31. **Last but not least, the Government emphasizes the importance of developing local sector skills to underpin the reform process and improve sector outcomes.** The GoC is considering the creation of a sector wide training program, focusing on hydropower generation, transmission projects, distribution



efficiency and power exports, to enhance the skills of local professionals along the value chain. Also, the development of skills for the emergence of a local manufacturing industry of equipment and components for rural electrification is a key priority. The integration of gender aspects to increase the participation of women in the sector will be woven into all training initiatives.

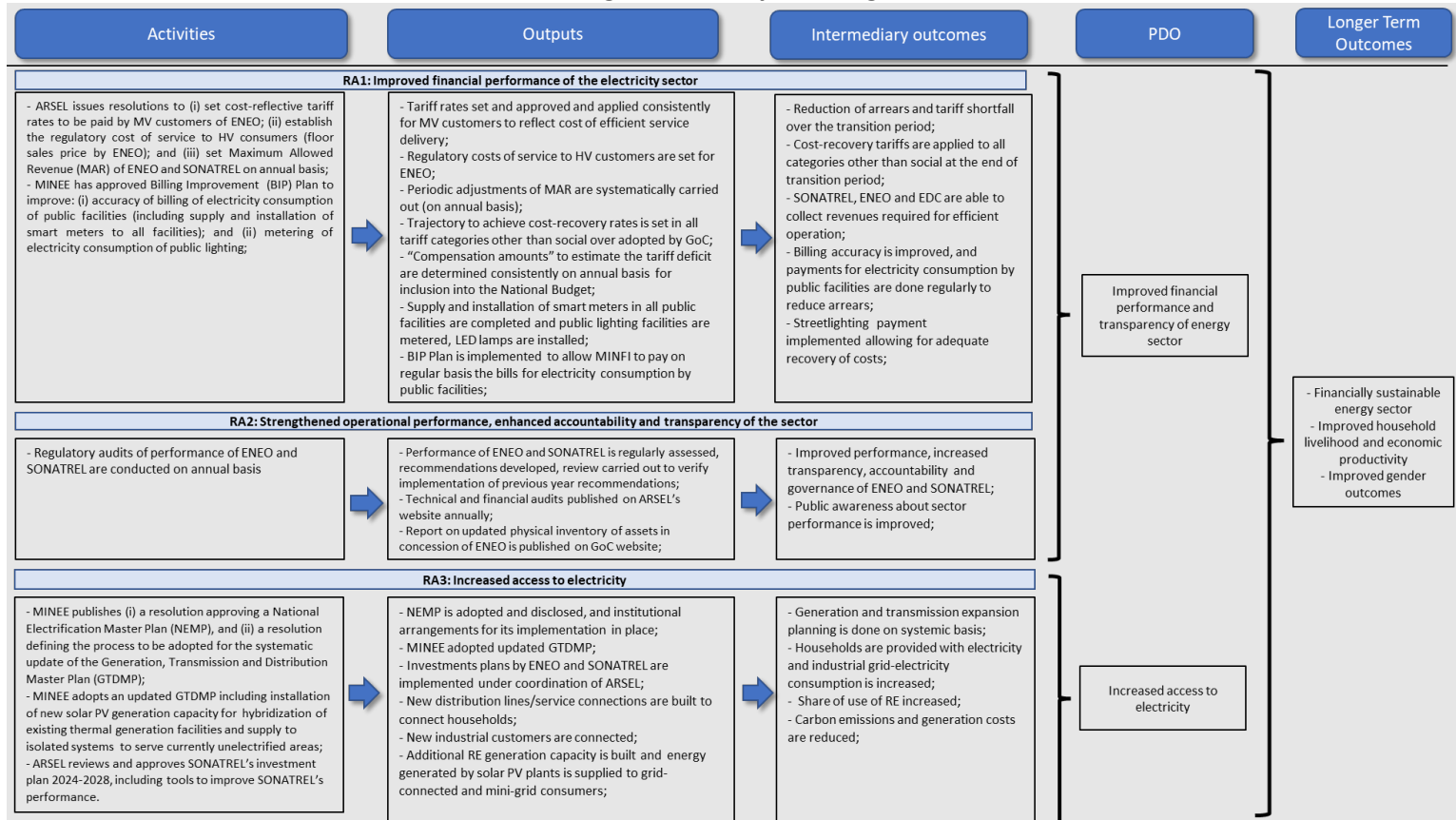
B. Theory of Change

32. The Theory of Change (results chain) in Figure 3 shows the causal link between activities, outputs, short-term outcomes, PDO-level outcomes, and longer-term outcomes. Achievement of the Program objectives hinges on the following critical assumptions which are supported by World Bank program including PASA, existing IPF operations and proposed PforR:

- (a) ARSEL will have issued the required resolutions to (i) set cost-reflective tariff rates to be paid by MV customers of ENEO; (ii) establish the regulatory cost of service to HV consumers (floor sales price by ENEO); and (iii) set Maximum Allowed Revenue of ENEO and SONATREL on an annual basis.
- (b) MINEE will have approved Billing Improvement Plan to improve (i) accuracy of billing of electricity consumption of public facilities (including supply and installation of smart meters to all facilities) and (ii) metering of electricity consumption of public lighting.
- (c) MINEE will have published (i) a resolution approving a National Electrification Master Plan (NEMP) and (ii) a resolution defining the process to be adopted for the systematic update of the Generation, Transmission, and Distribution Master Plan.
- (d) MINEE will have adopted an updated Generation, Transmission and Distribution Master Plan for expansion and rehabilitation, reinforcement and upgrade of electricity generation, transmission and distribution infrastructure approved by MINEE substantially in the form of a final draft plan prepared in accordance with the technical views of the World Bank.
- (e) ARSEL will have approved SONATREL's investment plan for rehabilitation and upgrade of existing transmission infrastructure for 2024–2028, including tools to improve SONATREL's performance.



Figure 3. Theory of Change





C. PforR Program Scope

33. **The proposed PforR Program is designed as a subset of the Government program and supports its priority areas.** It will support tariff adjustments for MV and HV clients to move toward cost-recovery and timely payment of electricity consumption of public facilities under Priority 3 (‘Towards a financially sustainable electricity sector’). It will also strengthen the regulatory monitoring of the distribution company’s performance to strengthen its accountability and incentivize its performance under Priority 4 (‘Improving performance of electricity sector operators’). The proposed PforR Program will provide strong support to Priority 5 (‘Increasing electricity access rate’) by enabling the approval of a robust EMP, leading to the connection of 211,000 households to the grid. In addition, the increase of transmission capacity to remove existing bottlenecks will be prioritized to improve the quality of supply and attract well-paying industries as ENEO customers under Priority 6 (‘Increasing industrial electricity consumption’). Particular emphasis will be given to technical assistance and capacity-building activities financed by the IPF component to support Priority 7 (‘Human capital and local skills development’). Table 4 provides the full summary of the PforR Program boundary.

Table 4. Summary of the PforR Program Boundary

Description	Government Program (CESRP 2023–2027)	Program Supported by the World Bank
Objectives	To achieve financial sustainability of the sector, ⁴² increase electricity access rate, improve the sector operators’ performance, and establish mechanisms to enable Cameroon to export electricity.	To improve financial performance and transparency of the electricity sector and increase access to electricity in Cameroon.
Duration	2023–2027	2023–2027
Geographic coverage	All 10 regions in the country	All 10 regions in the country
Pillars/Results areas (RAs)	1. Towards a greener electricity generation mix <ul style="list-style-type: none"> To phase out diesel for power generation by 2030 and reach an energy mix composed of 85 percent of hydropower generation, 10% natural gas-fired electricity and 5 percent of solar PV. The GoC’s objective is to install 5,000 MW of generation capacity by 2030. 	RA 3: Increased access to electricity DLI 6: Increase in renewable electricity supply to grid-connected and off-grid consumers.
	2. Reinforcement and extension of transmission network <ul style="list-style-type: none"> Build a single national transmission network. Stabilize electricity supply and ensure redundancy of major loads and strategic infrastructures. Modernize transmission network. Build transmission infrastructure for power exports. 	
	3. Towards a financially sustainable electricity sector <ul style="list-style-type: none"> Revise tariff schedule on cost-recovery basis and a mechanism for optimizing tariff compensation. Reduce transmission and distribution losses. Phase out HFO and diesel for power generation. Establish regular payment of electricity bills for government and public lighting. 	RA 1: Improved financial performance of the electricity sector DLI 1: Reduction of annual revenue gap (RG) between maximum allowed revenues (MAR) and tariff

⁴² Defined in terms that sector costs do not exceed sector revenues.



Description	Government Program (CESRP 2023–2027)	Program Supported by the World Bank
	<ul style="list-style-type: none"> Electricity exports 	<p>revenues (TR), expressed as a percentage of MAR.</p> <p>DLI 2: Timely payments of public administration’s electricity consumption and annual compensation by Ministry of Finance to ENEO, as per applicable regulatory framework.</p> <p>DLI 3: Public facilities with functioning smart meters and public lighting with functioning smart meters.</p>
	<p>4. Improving performance of electricity sector operators</p> <ul style="list-style-type: none"> ARSEL conducts performance audits of all operators. Finalizing performance contracts of EDC and SONATREL. MINEE monitors operators’ concessions through specialized committees. 	<p>RA 2: Strengthened operational performance, enhanced accountability and transparency of the electricity sector</p> <p>DLI 4: Reports on regulatory audits of performance of ENEO are completed and published annually.</p>
	<p>5. Increasing electricity access rate</p> <p>To reach universal electricity access in the country by implementing the following:</p> <ul style="list-style-type: none"> Develop a least-cost EMP through grid extension, mini-grids, and individual systems (update of the 2014 Rural Electrification Master Plan). Rehabilitate and strengthen existing networks. Build a smart grid network. Organize a donor roundtable to mobilize additional funding for the implementation of the EMP. 	<p>RA 3: Increased access to electricity</p> <p>DLI 5: Households provided with new electricity service.</p>
	<p>6. Increasing industrial electricity consumption</p> <p>MINEE’s diagnostic study identified an unmet industrial demand of 450 MW in the city of Douala and a large potential in Kribi. This strategic pillar will be implemented through</p> <ul style="list-style-type: none"> Optimization of HV substation’s capacities and rehabilitation of HV lines; Construction dedicated MV to supply industries; Adopting regulatory incentives for industries through time-of-use tariffs; and Monitoring and publishing SAIDI and SAIFI KPIs annually. 	<p>RA 3: Increased access to electricity</p> <p>DLI 7: Increase in available transformation capacity in transmission substations operated by SONATREL.</p>
	<p>7. Human capital and local skills development</p> <ul style="list-style-type: none"> Design a human resources curriculum in the electricity sector. Initiate capacity building of the sector’s personnel. Mainstream gender dimension in all activities. Develop a local manufacturing industry of rural electrification equipment. 	



Description	Government Program (CESRP 2023–2027)	Program Supported by the World Bank
Overall Financing	US\$1,381 million	US\$925 million, ⁴³ of which <ul style="list-style-type: none"> • US\$280 million IDA Credit • US\$645 million of GoC financing.

Note: SAIDI = System Average Interruption Duration Index; SAIFI = System Average Interruption Frequency Index.

World Bank-Financed Program-for-Results

34. The Program will support the implementation of activities designed to achieve the Government’s CESRP goals in three RAs as detailed in the following paragraphs.

35. **RA 1: Improved financial performance of the electricity sector.** To achieve this objective, the Program will support activities to increase liquidity in the sector by (a) reducing the gap between allowed electricity sector costs and tariff revenues through gradual increases in tariffs of MV and HV customers until cost-recovery is reached; (b) improving regular payments of the residual tariff subsidy, that is, compensation from MINFI to ENEO; and (c) ensuring timely payments to ENEO of electricity bills of public buildings’ consumption by enhancing the metering and billing accuracy and transparency. The application of cost-reflective tariff rates for MV customers (except those classified by the GoC as socially sensitive) and HV customers (except ALUCAM) of ENEO will increase the total revenues in the sector by US\$178 million (see Table 5) between 2024 and 2027. Ensuring the implementation of timely payment of government bills is expected to reduce the number of days it takes for ENEO to receive collections from its customers by 47 percent, that is, a reduction from 224 days to 118 days. This would also improve ENEO’s working capital by 76 percent or provide positive cash flows of US\$176 million equivalent over the period of the Program while reducing the liquidity crunch that ENEO currently faces.

36. **RA 2: Strengthened operational performance, enhanced accountability and transparency of the electricity sector.** The Program will support ARSEL and MINEE to improve the monitoring of the performance of the electricity distribution concessionaire, ENEO, and the transmission company SONATREL, through developing, conducting, and publishing (annual) technical audits. The Program is expected to enable ARSEL to complete an annual technical audit (including a physical inventory of assets in the concession) on ENEO’s and SONATREL’s annual performance, provide recommendations to be implemented, and make the reports available to the public. In addition, ARSEL is expected to approve a Performance Improvement Plan (PIP) of SONATREL, which will include activities to improve its business processes and an investment plan for the rehabilitation and upgrade of existing transmission infrastructure for 2024—2028. The PIP will be incorporated in SONATREL’s updated performance contract to be signed with the GoC. These measures will be critical to increase trust among sector stakeholders, which is a steppingstone to improve operational performance.

37. **RA 3: Increased access to electricity.** The Program will support investments to increase access to electricity to households and industries in urban and rural areas and reduce thermal generation, by (a) extending and densifying the national distribution grid up to 15 kV to connect new households; (b) reducing existing bottlenecks in the transmission system by rehabilitating and upgrading existing high-voltage substations to increase the total installed transformation capacity; and (c) supporting the

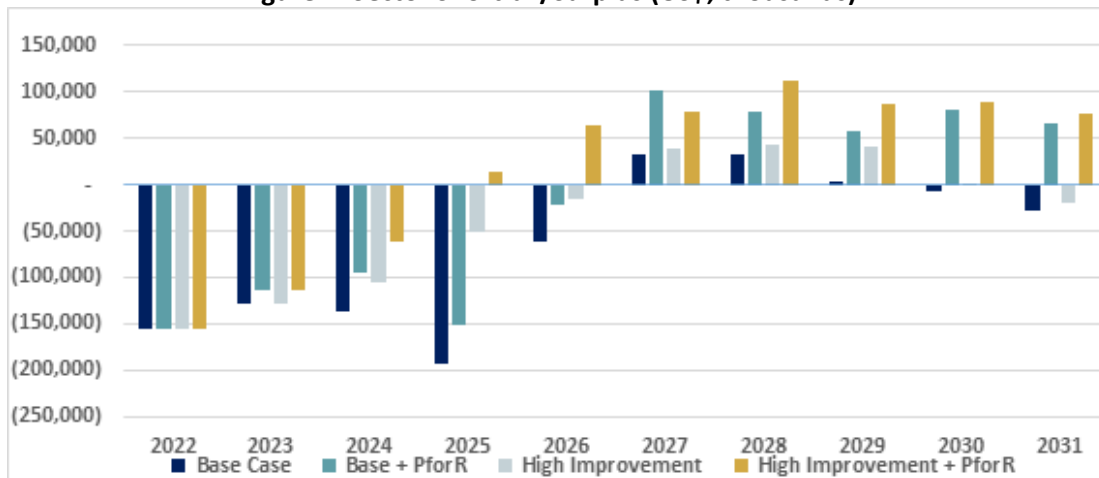
⁴³ Rehabilitation of HV lines and construction of mini-hydropower plants are not included in the scope of the PforR Program (US\$925 million) but are included in the GoC program (US\$1,381 million).



installation of solar PV generation capacity to reduce fuel consumption in existing isolated thermal power generation systems and power currently unserved areas through mini-grids. Thus, the Program is expected to bring electricity to 211,000 households and benefit about 1.1 million people. The Program is also expected to remove existing bottlenecks in the transmission system by increasing the total installed transformation capacity by 8 percent, which will enable industries currently relying on generators to sustain their businesses to be connected to the national grid. Lastly, the Program will support the installation of 22 MW of solar PV generation capacity to power existing isolated systems supplied with thermal generation and new ones built to supply new electricity consumers. This additional solar PV capacity is expected to bring cost savings of US\$54 million (3 percent of total system generation costs) in diesel fuel for power generation during the Program implementation period. On the other hand, transmission investments to reduce existing bottlenecks will enable an estimated increase of 302 GWh in consumption by industrial electricity customers, which will provide US\$25 million of additional system net revenues by 2026 increasing to US\$37 million by 2027.

38. **The PforR will contribute to the overall sector turnaround targeted by the Government program (see Figure 4).** Upon arrival of energy from Nachtigal at the end of 2024, the sector could experience significant revenue shortfall if the transmission and distribution investments necessary to connect the additional supply to the demand are not operational. Projected estimates of the sector shortfall show that the difference between sector costs and revenues could increase to US\$200 million in 2025 under the base case scenario, which assumes no tariff increases and the inability to fully evacuate the power from Nachtigal. In subsequent years, acceleration of transmission and distribution investments to absorb Nachtigal capacity will be key to returning the sector to a financially sustainable situation by 2027, assuming normal hydrological conditions. The sector, however, remains exposed to the volatility of hydrological conditions in the north and of international prices of oil fuels. From 2029 to 2031, the sector is projected to experience supply deficits to meet growing demand until additional planned generation sources come online.⁴⁴

Figure 4. Sector Shortfall/Surplus (US\$, thousands)⁴⁵



Source: World Bank, 2023.

⁴⁴ In 2029, the energy generation from mini-hydro power plants is not sufficient to cover the system’s demand; hence, thermal plants must be turned on resulting in higher generation costs that year.

⁴⁵ Scenario Definitions



39. **The PforR will enable US\$427 million of additional revenues to the sector, improve sector liquidity and increase access to electricity.** To mitigate the financial impacts of potential sector shortfall in next two years, the PforR will contribute to reduce the sector shortfall by around 25 percent in 2025, and significantly improve sector liquidity through proposed DLIs, which will also strengthen ENEO’s capacity to honor contractual payments to all its vendors, including energy purchases from the developer of Nachtigal, NHPC. The financial and sector impact of the PforR is illustrated in Table 5 below.

Table 5. Financial and other sector impact of PforR

In US\$ millions		2024	2025	2026	2027	Total
Financial impacts – PforR revenue impact						
DLI1	Revenue from tariff increases	25	38	54	62	178
DLI5	Revenue from additional clients (LV)	-	14	30	66	111
DLI6	Revenue from avoided generation costs due to solar hybridization	15	15	9	15	54
DLI7	Revenue from additional sales to industries (100 MW)	7	16	25	36	84
	Total financial impacts	47	83	118	179	427
Other sector impacts of PforR						
DLI2	Timely payment of public sector electricity consumption ⁴⁶	23	23	23	23	90
DLI2	Timely payment of compensation ⁴⁷	73	166	81	39	358
DLI5	Additional connections to distribution grid*	-	46,000	50,000	115,000	211,000

* Connections are shown in household numbers.

40. **Program beneficiaries.** The beneficiaries of the Program will include the following:
- (a) **Households.** In addition to the connections contractually required for ENEO,⁴⁸ the Program will benefit 211,000 new households, or about 1.1 million people, with new or improved access to electricity. The connections will prioritize peri-urban and rural areas to close the urban and rural gap, which have 94 percent and 25 percent of access to electricity, respectively. Increased access to electricity will contribute to lift populations out of poverty by enabling newly connected consumers to undertake productive and income-generating activities and providing enhanced access to information through phone, radio, and television.
 - (b) **Industries and medium-size companies.** The increase in transformation capacity in the existing transmission system will remove bottlenecks and allow industries and medium-size companies to restore their trust in the national grid as their main electricity source. Due to the grid’s poor quality of supply, a significant number of industries and medium-size companies currently rely primarily on thermal generators to run their businesses.⁴⁹ The Program is expected to reduce the dependency of industries and medium-size companies

(a) Base case: no tariff increase, Nachtigal evacuation 2024, 2025: 50 percent, 2026: 70 percent, 2027:100 percent

(b) Base case +PforR: Base case plus impacts from achieving results under DLIs

(c) High improvement: ENEO’s loss reduction 2024: 24.5 percent, 2028:15 percent 2031: 12 percent, no tariff increases, Nachtigal evacuation 2024: 50 percent, 2025: 100 percent

(d) High improvement +PforR: High improvement scenario plus impacts from achieving results under DLIs

⁴⁶ Projections are based on historical public administration invoices of XAF 14 billion or US\$23 million.

⁴⁷ Projections are based on simulations from regulator and World Bank estimates on target compensation in 2027.

⁴⁸ According to its concession contract (amendment 3), ENEO is required to install 342,000 connections from 2023 to 2027.

⁴⁹ MINEE has identified a latent industrial demand of 450 MW in Douala city only.



on expensive diesel generation and contribute to improve their productivity by reducing their production costs.

- (c) **Electricity sector institutions.** The Program will improve ENEO's cash flow and liquidity of the sector, by adopting cost-recovery tariffs for MV and HV consumers (except ALUCAM⁵⁰) and reducing the electricity tariff deficit to 5 percent by 2027. In addition, ENEO will benefit from the timely payment of the Central Government's electricity bills and compensation, which currently hinder its financial position. As the unique collector of sector revenues from customers, the improved cash flow will allow ENEO in turn to honor its payment obligations to SONATREL and EDC, which will also benefit significantly from the Program. An improved financial position will allow ENEO to keep pace with investments in distribution and improve the quality of service. Also, MINEE, ARSEL, Rural Electrification Agency (*Agence d'Electrification Rurale*, AER), EDC, and SONATREL will benefit from significant technical assistance and consultancy services under the IPF component. In addition, the Program will provide strong emphasis on capacity building through the development of a technical training program for the benefit of all sector institutions and an internship program to draw talented professional women to the sector.
- (d) **Private sector.** The improvement in ENEO's liquidity situation due to increased revenues and timely payment of government invoices as described in (c) above would also improve ENEO's ability to pay its for power purchased under PPAs with IPPs in the sector (KPDC, DPDC, and NHPC) and private fuel suppliers in the country. This would increase the trust between IPPs and ENEO and avoid situations where power supply is interrupted due to lack of payment by ENEO. A more financially self-sufficient energy sector supported by the PforR Program would support the sustainability of existing private sector participation and also attract further private sector investments in the sector in the generation and distribution segments. The future of ENEO contingent on ongoing negotiations for change in ownership structure of ENEO would have implications for future financial performance of ENEO and hence the sector. However, the financial gains stated above would continue to benefit the sector under all scenarios.

41. **Excluded activities.** The Program will not support the construction or upgrades of (a) large power plants such as hydropower plants and utility-scale solar PV plants or (b) transmission and high-voltage distribution lines and new HV substations. The Program will not support activities that are likely to have significant adverse impacts that are sensitive, diverse, or unprecedented on the environment and/or affected people. Any infrastructure investment activity that will entail conversion or degradation of critical natural habitats or critical cultural heritage sites, impact indigenous peoples or cause land acquisition or the use of forced evictions are excluded.

D. Program Development Objective(s) (PDO) and PDO Level Results Indicators

42. The PDO is to improve financial performance and transparency of the electricity sector, and increase access to electricity in Cameroon.

43. The following outcome indicators will be used to measure achievement of the PDO:

⁵⁰ ALUCAM is the aluminum smelting company of Cameroon, which has historically benefitted from low tariffs and is subsidized by the GoC.



- (a) Reduction of annual revenue gap between maximum allowed revenues and tariff revenues (Percentage);
- (b) Timely payments of public administration’s electricity consumption and annual compensation (Text);
- (c) Public disclosure of annual audits of ENEO and SONATREL performance reports (Text);
- (d) People provided with new or improved electricity service (CRI, Number):
 - (i) People provided with new or improved electricity service - Female (CRI, Number).

E. Disbursement Linked Indicators and Verification Protocols

44. The choice of DLIs for the PforR is based on four factors: (a) the importance of the indicator that requires structural/critical actions to be undertaken in the sector to achieve the PDO; (b) the capacity of the Borrower and implementing entities to deliver the results in the PforR implementation period; (c) the definition of results that are verifiable objectively; and (d) the need to introduce financial incentives to deliver results.

Table 6. DLIs

DLIs	Rationale for Selection
RA 1: Improved financial performance of the electricity sector	
DLI 1: Reduction of annual revenue gap (RG) between maximum allowed revenues (MAR) and tariff revenues (TR), expressed as a percentage of MAR.	<p>The purpose of this DLI is to improve the financial performance of the sector, moving it closer to financial self-sustainability by progressively reducing the gap between its allowed costs across the supply chain, quantified through the MAR of ENEO, and tariff revenues collectable by the utility, commonly known as ‘compensation’. After 10 years with unchanged rates in all categories, this trajectory was initiated in December 2022 through adjustments of tariffs applied to MV consumers comprising 5–10 percent yearly increases until reaching cost-recovery in 2026. The gap (‘compensation’) will be further reduced in the medium term (three–four years) due to the combined effects of incorporation of generation from Nachtigal hydropower plant and increased demand, which will both contribute to a lower cost-reflective average tariff level.</p> <p>As the electricity demand in Cameroon is expected to grow at high rates over many years before the sector achieves maturity, it will result in an increasing trajectory for MAR. In this context, the most adequate approach is to assess reduction in the amount of compensation as a percentage of MAR, rather than in absolute terms, as a proof of the Government’s commitment to gradually move toward financial self-sustainability of the sector.</p>
DLI 2: Timely payments by Ministry of Finance to ENEO of electricity consumption of central government buildings and of public lighting and of annual compensation, as per applicable regulatory framework	<p>The purpose of this DLI is to improve the financial performance of the sector by enabling regular payments to ENEO of fully accurate and auditable bills for electricity consumption of facilities of the Central Government and public lighting, as well as annual amounts of compensation to cover tariff shortfalls.</p> <p>According to ENEO data, 68 percent of its 2020 receivables were from the Central Government, which included electricity consumption of public buildings, public lighting, and compensation. State-owned enterprises represented 18 percent of ENEO’s receivables, while delayed payments from municipalities, universities, and hospitals were 14 percent of the total. Hence, this DLI targets Central Government electricity consumption and annual compensation because of its larger financial impact in this first PforR in the country.</p>



DLIs	Rationale for Selection
DLI 3: Public facilities with functioning smart meters and public lighting with functioning smart meters	To incentivize timely payments for electricity consumption of facilities of the Central Government and public lighting, a program to install smart meters will be led by MINEE that will allow ENEO to issue accurate bills for actual consumption and the GoC to assess the accuracy of those bills by monitoring consumption remotely. With regard to public lighting, the installation of smart meters will replace the current billing based on consumption estimates, which are inherently inaccurate. Besides, the GoC will have the option to activate the pre-paid function in the installed smart meters in some of its facilities, as needed.
RA 2: Strengthened operational performance, enhanced accountability and transparency of the electricity sector	
DLI 4: Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually	<p>The purpose of this DLI is to track systematic compliance by ARSEL with its core regulatory duty to monitor ENEO’s performance as prescribed in the concession contract and, if needed, adopt corrective action according to the contract provisions to enforce achievement of KPIs on performance (losses, new connections, quality of service, and so on) agreed for the extension of the concession contract until 2031. Similarly, ARSEL will systematically monitor SONATREL’s performance.</p> <p>Performance oversight by ARSEL of performance of ENEO and SONATREL is key to ensure that the sector operates in a sustainable manner as prescribed in an applicable legal and regulatory framework and that rights of captive users and efficient operators are duly protected.</p> <p>Regulatory audits of performance of both companies will be key tools to allow ARSEL to comply with its core regulatory duty and ensure sustainability. They will include identification of eventual deviations from expected performance and recommendations on how to address/correct them. In each annual audit, what was done to address recommendations from previous ones will be verified.</p> <p>Depending on the severity of noncompliance with agreed values of KPIs and other contract provisions, corrective actions may vary from application of penalties (capped at 3 percent of ENEO’s annual turnover) to early termination of the contract and intervention of ARSEL in ENEO’s management.</p>
RA 3: Increased access to electricity	
DLI 5: Households provided with new electricity service	<p>The purpose of this DLI is to track improvements in the quality of electricity service provided to existing consumers and connection of new users to increase overall electrification rate and foster systematic least-cost generation and transmission and electrification planning (as key enablers of sector sustainable development), through the approval of an EMP and the process to be adopted for systematic update of the Generation and Transmission Master Plan.</p> <p>ENEO’s concession contract has limited targets regarding connection of new customers. This is consistent with the fact that, even in high-middle-income countries, investments in grid extension for electrification are implemented through public funding. This DLI acknowledges this reality and the need for complementary public investment to achieve the objective of universal access to electricity according to NDS-30. Specifically, this DLI will enable the electrification of 211,000 households by the end of the PforR, benefitting about 1.1 million people in urban and peri-urban areas.</p>
DLI 6: Increase in renewable electricity supply to grid-connected and off-grid consumers	This DLI tracks progress in increasing the share of renewable energy in the electricity generation mix, by hybridizing existing thermal plants in systems where this is the main primary resource with solar PV to reduce heavily subsidized fuel consumption and lower related GHGs emissions and operating costs. This action is part of the least-cost generation and transmission expansion plan, which calls for a significant reduction in use of imported oil products for thermal generation, replacing them with generation based on renewable resources to the largest extent compatible with security of supply criteria.



DLIs	Rationale for Selection
DLI 7: Increase in available transformation capacity in transmission substations operated by SONATREL	The purpose of this DLI is to eliminate bottlenecks and other issues in the existing transmission infrastructure operated by SONATREL, created by several years of systematic underinvestment in the segment, which affect the quality and reliability of transmission services and limit electricity consumption of large users and demand growth in general, despite the availability of sufficient generation capacity. The regulator will approve SONATREL’s investment plan 2024-2028, including tools to improve SONATREL’s performance, and the GoC and SONATREL’s Board will sign an updated performance contract incorporating the investment plan approved by ARSEL. Investments in the plan aimed at increasing installed transmission capacity in existing substations will be financed through the Program to minimize safeguards risks and maximize positive impacts on quality and reliability of transmission services.

45. **The verification of achievement of the seven DLIs will be carried out by a third-party independent verification agency (IVA) recruited on the basis of terms of reference (ToR) agreed by the World Bank.** The Program Implementation Unit (PIU)⁵¹ hosted at MINEE will prepare bi-annual reports and an annual report on the achievement of results with data provided by the implementation agencies and the owner’s engineers. The IVA will use the bi-annual and annual reports to verify the reported results. The detailed verification protocols for each DLI are presented in the Annex 3 and summarized in the following paragraphs.

46. **DLI 1: Reduction of annual revenue gap between maximum allowed revenues and tariff revenues, expressed as a percentage of MAR⁵².** The regulator ARSEL will set the value of MAR of the sector to carry out operations efficiently annually, including estimates of the compensation. In the first half of each year, the regulator ARSEL will issue a resolution setting the final value of MAR and annual value of compensation for the previous year, based on ex-post values of sales, costs in each segment of the value chain, etc. **Verification protocol:** Starting in 2025, IVA verifies resolutions issued by ARSEL on final values (determinations) of MAR and annual value of compensation for the previous year. The IVA calculates the annual RG as per agreed formula $RG = 100 \times (C/MAR)$, where C is the annual value of compensation

47. **DLI 2: Timely payments by Ministry of Finance to ENEO of electricity consumption of central government buildings and of public lighting and of annual compensation, as per applicable regulatory framework.** The purpose of this DLI is to improve the financial performance of the sector by enabling regular payments to ENEO of fully accurate and auditable bills for electricity consumption of facilities of Central Government and public lighting, as well as of annual amounts of compensation to cover tariff shortfalls. **Verification protocol:** The IVA verifies whether: (a) the amount of compensation included in the annual finance law has been paid by MINFI to ENEO in quarterly disbursements made not later than three months after the end of each quarter, (b) public lighting bills estimated by ARSEL have been paid by MINFI to ENEO as indicated in Annex 2.

48. **DLI 3: Public facilities and public lighting with functioning smart meters.** To improve accuracy of billing and enable payment of the Central Government’s electricity consumption (DLI 2), MINEE will implement a ‘Billing Improvement Plan’ consisting of (a) the installation of smart meters and advance metering infrastructure in all public facilities of the Central Government (around 15,000) and (b) the

⁵¹ The PIU is also called Operation Implementing Unit (OIU) in the Financing Agreement. Both terms are synonyms.

⁵² MAR is maximum allowed revenues of the sector to carry out operations, determined every year by ARSEL.



implementation of a public lighting consumption metering plan targeting 150,000 lamps. **Verification protocol:** MINEE will shares: (a) Documents describing universe of points of electricity supply to: (i) public buildings; and (ii) public lighting as of January 1, 2024, including coordinates of each point in a geographic information system (GIS) supported database and dated digital photos of each point (dated newspaper or equivalent document included in the photo); and (b) Report on execution of each semester, including: (i) Coordinates in the GIS supported database of the initial document of each point of electricity supply to public facilities where a smart meter was installed, together with a digital photo of the metering premises of the point of supply where the smart meter was installed; (ii) Coordinates in the GIS supported database of the initial document of each point of electricity supply to public lighting where a smart meter and high efficiency lamps were installed, together with a digital photo of the metering premises of the point of supply where the smart meter was installed. IVA carries out physical inspections of public buildings and public lighting facilities reported with new meters by sampling, with representative samples defined as per national or International Organization for Standardization (ISO) applicable standards.

49. **DLI 4: Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually.** ARSEL will conduct annual regulatory audits on ENEO's and SONATREL's performance, including identification of eventual deviations from expected performance and recommendations on how to correct them. In each annual audit, the actions undertaken to address recommendations from previous ones will be verified, and future determinations of MAR by ARSEL may be adjusted accordingly. **Verification protocol:** ARSEL will conduct annual regulatory audits on ENEO's and SONATREL's performance, including the identification of eventual deviations from expected performance and recommendations on how to address/correct them. In each annual audit, it will be verified what was done to address recommendations from previous ones, and future determinations of MAR by ARSEL may be adjusted accordingly. The IVA verifies that: (a) ENEO's and SONATREL's performance audit of the previous year is disclosed on ARSEL's website during the first quarter of the next year with the timestamp of disclosure; (b) disclosed performance audit report identifies eventual deviations from KPIs in the concession contract of ENEO and expected performance of SONATREL, and recommendations on how to correct them; and (c) disclosed performance audit describes actions undertaken to address recommendations in the performance audit of the previous year.

50. **DLI 5: Households provided with new electricity service.** MINEE is expected to (a) prepare an EMP and disclose its approval resolution and (b) disclose the resolution defining the process to be adopted for the systematic update of the Generation and Transmission Master Plan. MINEE's PIU, with the support of an owner's engineer, is expected to build 211,000 new household connections to benefit about 1.1 million people with access to electricity. **Verification protocol:** Based on information provided by MINEE as detailed in Annex 2, the IVA verifies that: (a) the number of new connections reported by MINEE's PIU in its annual reports is correct by carrying out physical inspections through sampling, with representative samples defined as per ISO standards; and (b) Resolutions approving NEMP and defining the process to be adopted for the systematic update of the Generation and Transmission Master Plan are disclosed in MINEE's website.

51. **DLI 6: Increase in renewable electricity supply to grid-connected and off-grid consumers.** 44.66 GWh of solar PV power generation is expected to be produced over the program duration through the hybridization of thermal plants (grid connected and supplying isolated systems) currently running on diesel thermal generation with public financing. Additional capacity may be eventually installed through ongoing private initiatives. **Verification protocol:** Based on information provided by MINEE as detailed in



Annex 2, the IVA verifies: (a) total annual generation from additional solar PV systems commissioned after the Program approval dates by carrying out physical inspection of new solar PV generation facilities and checking data loggers, and (b) MINEE has issued and disclosed a resolution adopting an updated Generation, Transmission and Distribution Master Plan.

52. **DLI 7: Increase in available transformation capacity in transmission substations operated by SONATREL.** SONATREL is expected to procure investments to upgrade and rehabilitate the existing substations to eliminate bottlenecks and other issues in the existing transmission infrastructure. These constraints currently affect the quality and reliability of transmission services, and limit electricity consumption of large users, despite the availability of sufficient generation capacity. To this end, ARSEL is expected to approve SONATREL’s investment plan, including tools to improve its performance. **Verification protocol:** Based on information provided by MINEE as detailed in Annex 2, the IVA verifies that: (i) new/upgraded transformers reported in SONATREL’s annual reports on transformation capacity added to existing HV substations, are operational by carrying out physical inspection, (ii) ARSEL has issued a resolution approving SONATREL’s investment plan 2024-2028, and (iii) GOC and SONATREL’s Board have signed and updated a Performance contract incorporating the investment plan approved by ARSEL.

F. Program Financing

53. The duration of the PforR is from 2023 to 2027. The PforR covers all the 10 regions in Cameroon. The total PforR Program financing is US\$925 million, of which US\$645 million will be financed by the GoC and US\$280 million will be financed by the IDA Credit (see Table 7).

Table 7. Program Financing (2023–2027)

Source	Amount (US\$, millions)	% of Total
Government	645	69.7
IDA	280	30.3
Total	925	100.0

G. Expenditure Scope

54. The Program consists of three RAs. Table 8 provides the breakdown of the Program financing by RAs. Of the total Program financing of US\$925 million, RA 1 accounts for 59.7 percent, RA 2 for 0.5 percent, and RA 3 for 39.8 percent. RA 1 involves support to cover the gap between recognized sector costs and tariff revenues and significant investments in metering of public facilities and public lighting. RA 2 involves the regulator’s expenditures to carry out ENEO’s performance audits and yearly verification of what was done to address recommendations from previous ones. RA 3 comprises large investments in distribution grid extension, densification and household connections, and solar PV for hybridizing thermal power generation and investments for the rehabilitation and upgrade of existing transmission infrastructure.

Table 8. Program Financing by RAs (2023–2027)

RAs	Sub-Total (US\$ millions)	Share of PforR Program (%)
RA 1	551.75	59.7
RA 2	5.00	0.5
RA 3	368.25	39.8
Sub-total	925.00	100.0



H. Expenditure Framework

55. The proposed PforR will support and incentivize the GoC in a transformational shift toward improved financial and operational performance of the sector, which will unlock further private investment in the sector and increased access to electricity.

56. The Program expenditure framework (Table 9) shows the contribution of the PforR Program to the pillars and key actions.

Table 9. Program Expenditure 2023–2027 by Pillars and Expenditure Components

Pillar	Expenditure Component	Government program (US\$, millions)	PforR Program		Executing agency
			RA	US\$, millions equivalent	
1. Towards a greener electricity generation mix	Solar PV development by hybridization of thermal plants	42.70	RA 3	42.70	MINEE
	Construction of mini-hydropower plants in eight regions	8.00	—	0.00	-
2. Reinforcement and extension of transmission network	SCADA for network modernization	13.00	—	0.00	-
	Upgrade, maintenance, and rehabilitation of existing HV substations	77.15	RA 3	77.15	SONATREL
3. Towards a financially sustainable electricity sector	Tariff subsidy payment mechanism, and timely payment of public administration and public lighting’s electricity bills	551.75	RA 1	551.75	MINFI
	Update of strategic and technical documents and enabling environment for power exports.	6.90	RA1/RA3	1.70	MINEE
4. Improving performance of electricity sector operators	Regulatory information system platform, performance audits, new tariff structure	5.00	RA 2	5.00	ARSEL
	Implementation sector stakeholder’s investment plans	354.80	-	0.00	-
	Specialized committees to monitor concessions	2.40	—	0.00	-
5. Increasing electricity access rate	Up to 15 kV grid extension and rehabilitation for electrification in urban and rural areas	246.50	RA 3	246.50	MINEE
	Smart grid implementation	13.0	-	0.0	-
6. Increasing industrial electricity consumption	Rehabilitation of HV lines	34.4	—	0.0	-
7. Human capital and local skills development ⁴⁶	Human Resources (HR) curriculum in electricity sector	1.5	—	0.0	-
	Creation of training center for sector professionals	16.2	—	0.0	-
	Report on strategies to integrate gender aspects in electricity sector	0.2	—	0.2	MINEE



Pillar	Expenditure Component	Government program (US\$, millions)	PforR Program		Executing agency
			RA	US\$, millions equivalent	
	employment				
	Local manufacturing of equipment for rural electrification	7.5	—	0.0	-
Total (US\$, millions) ⁵³		1,381.0		925.0	
As % of Government program				67.0	

57. PforR financing will be disbursed following the achievement of results under DLIs across the three RAs. These will serve as milestones in achieving the PDOs. Achievement of all DLIs will be monitored and verified by an IVA based on the verification protocols. The detailed description of verification protocols is presented in Annex 3 (Technical Assessment).

Table 10. Summary of DLIs and Financing

RA	Summary of DLIs	Allocation (US\$ million equivalent)	%	Implementing Institution
RA 1: Improved financial performance of the electricity sector	DLI 1: Reduction of annual revenue gap (RG) between maximum allowed revenues (MAR) and tariff revenues (TR), expressed as a percentage of MAR	40.0	14.3	ARSEL
	DLI 2: Timely payments of public administration's electricity consumption and annual compensation by Ministry of Finance to ENEO, as per applicable regulatory framework	40.0	14.3	MINFI
	DLI 3: Public facilities with functioning smart meters and public lighting with functioning smart meters	40.0	14.3	MINEE
RA 2: Strengthened operational performance, enhanced accountability, and transparency of the electricity sector	DLI 4: Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually	7.0	2.5	ARSEL
RA 3: Increased access to electricity	DLI 5: Households provided with new electricity service	53.0	18.9	MINEE
	DLI 6: Increase in renewable electricity supply to grid-connected and off-grid consumers	34.0	12.1	MINEE
	DLI 7: Increase in available transformation capacity in transmission substations (high/primary voltage 90 kV and above) operated by SONATREL	66.0	23.6	SONATREL
	Total	280.0	100.0	

⁵³ The World Bank provides financing in the amount of US\$280 million equivalent for the Program and US\$20 million equivalent for implementation of IPF component.



I. IPF component

58. The operation is designed as a hybrid instrument which includes an IPF component of US\$20 million equivalent. The implementation of PforR will require well-coordinated, timely, and focused technical support to respective implementing agencies.

59. **Component 1: Implementation support and capacity building.** This component will support Program implementation and provide capacity building to key sector agencies.⁵⁴ The component will finance: (a) Program management, policy development, monitoring & evaluation, and DLIs/DLRs verification; (b) technical assistance and training, including study tours, to strengthen institutional capacity of ARSEL, MINEE, CELCOR/MINEE⁵⁵, Chamber of Accounts (CoA), SONATREL, AER and EDC; (c) construction of a Center of Excellence and installation of technical laboratory equipment inside the perimeter of the existing campus of the University of Ngaoundéré for the development of technical competences in the energy sector.

60. A PIU will be established and will provide overall coordination support for the implementation of the PforR activities and as the secretariat of the Inter-ministerial Committee. **A Fiduciary assessment was undertaken to evaluate the adequacy of the project Financial Management (FM) and procurement arrangements for the IPF component.** Although the PIU is new, MINEE has experience in coordinating World Bank-financed projects. The overall FM residual risk was considered Substantial, and the proposed FM and procurement arrangements are considered acceptable to the World Bank. Funds flow will rely on the Government's banking arrangements through the Autonomous Amortization Fund (*Caisse Autonome d'Amortissement*, CAA). The World Bank will disburse funds for the IPF component to the Designated Account (DA) denominated in XAF and opened at a commercial bank. Report-based disbursement will apply, and the DA will receive an initial deposit equivalent to six months' expenditures forecast and will be replenished regularly through the Interim Financial Report (IFR).

61. Under this component, the use of World Bank's procurement procedures will enable the GoC to attract world-class consultancy services and strengthen local capacity. Details of activities proposed under the IPF component are included in Annex 8.

⁵⁴ This includes: (a) providing technical and financial support for the carrying out of the operation, including the operational expenses of an operation coordination unit, inter-institutional coordination, monitoring and evaluation of operation activities, and the verification of DLIs/DLRs; and (b) providing capacity building, technical assistance to prepare technical bidding documents and supervision of works under the infrastructure investments in distribution (access), transmission and generation (installation of solar PVs) and carrying out technical and feasibility studies in support of the electricity sector reforms; Providing technical assistance and strengthening the institutional capacity of ARSEL on, (i) establishing its integrated regulatory information system (monitoring database), (ii) establishing and regularly updating a database with international and regional benchmark prices of electricity materials and components, and (iii) drafting a report on an updated physical inventory of ENEO's assets. Strengthening the institutional capacity of MINEE to carry out its mandate and providing technical assistance for the preparation of: (i) an Electrification Master Plan, including annual targets, financing needs and electrification database; and (ii) a generation-transmission-distribution master plan, including a demand forecast assessment and a mechanism of successive updates.

⁵⁵ Recipient's anti-corruption unit in the MINEE.



III. PROGRAM IMPLEMENTATION

A. Institutional and Implementation Arrangements

62. **MINEE will be responsible for overall coordination, supervision, and implementation of the PforR Program.** Thus, MINEE will be responsible for delivering results under the DLIs, with the support of a PIU, in coordination with relevant entities in charge of implementing the DLIs. ARSEL will be in charge of implementing activities to reach results under DLIs 1 and 3, MINFI will be responsible for DLI 2, MINEE will be in charge of Sub-DLI 2.1 and DLIs 4 and 5, while SONATREL will implement investments required to achieve results under DLI 6.

63. **The Decree N° 021 of March 6, 2023, signed by the Prime Minister created an Inter-ministerial Committee in charge of the preparation, monitoring and evaluation of PforR activities and actions.** The Inter-ministerial Committee is composed of an Inter-ministerial Strategic Committee (ISC) and an Inter-ministerial Technical Committee (ITC).

64. **The ISC is chaired by the Secretary General of the Prime Minister, co-chaired by the Minister of Water Resources and Energy.** It aims to: (a) approve the CESRP priority action plans; (b) prepare the methodology needed to implement the PforR; (c) determine and assess the required sectoral reforms; and (d) monitor and evaluate PforR implementation. ISC members include the Ministers of Finance, Economy, Industry and Trade. Development partners, including the World Bank Group, are granted an observer status.

65. **The ITC is chaired by the MINEE and is composed of representatives from key Ministries and sector stakeholders.** Its main role is to prepare technical assessments and to implement recommendations and guidance provided by the ISC. The ITC will ensure coordination between implementing entities to achieve the PforR Program results and support the PIU in removing obstacles to effective implementation. Key representatives of MINEE, MINFI, MINEPAT⁵⁶, ARSEL, SONATREL, EDC, and ENEO, among others, will be members of the ITC, which will meet bimonthly to monitor PforR progress based on the PIU reports. The ITC will also approve the Annual Workplan and Budget (AWPB) by June 30 every year and regularly update it as needed. The PIU will be in charge of drafting the AWPB for ITC approval to achieve annual PforR disbursement-linked result (DLR) targets and meet annual technical assistance needs under the IPF component.

66. **The PIU⁵⁷ will be created at the Directorate of Electricity of the MINEE. A Program Coordinator will be appointed by the MINEE to coordinate key stakeholders to achieve disbursement-linked results and to implement the program action plan.** The Program Coordinator will have primary responsibility for the timely reporting of Program implementation milestones to the Minister of Energy and to the Inter-ministerial Committee, as well as the World Bank. PIU will also include, inter alia, (a) a deputy coordinator in charge of monitoring and evaluation; (b) a procurement specialist; (c) a financial management specialist; (d) an environmental safeguards specialist; (e) a social safeguards specialist; and (f) an assistant. PIU establishment is an effectiveness condition.

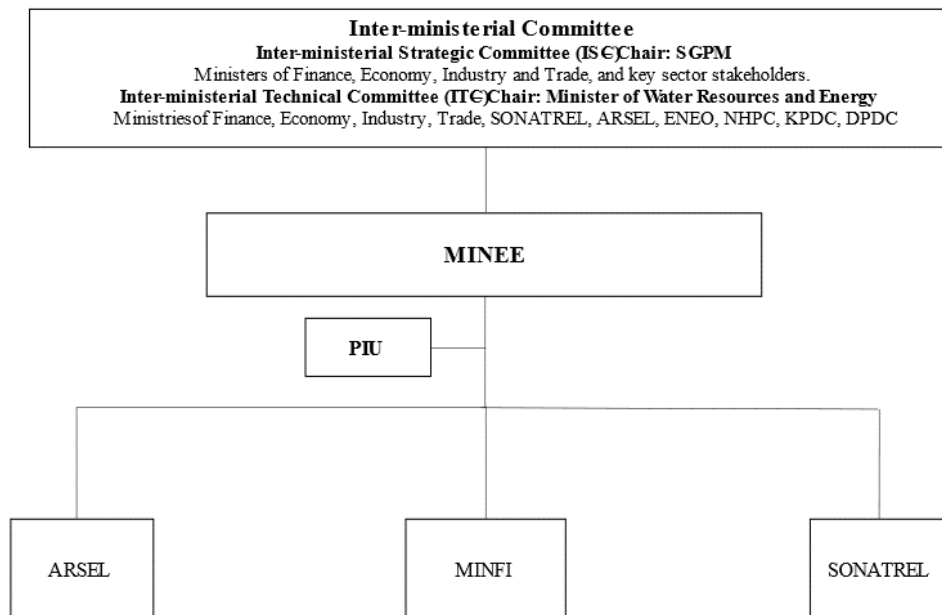
⁵⁶ Ministry of Economy, Planning and Land Planning (*Ministère de l'Economie, de la Planification et de l'Aménagement du Territoire*).

⁵⁷ PIU and OIU (Operation Implementation Unit) are used interchangeably in the text.



67. The DLR-allocated amounts will be disbursed to a sub-account to the Treasury single account after confirmation by an IVA. The creation of a sub-account will ensure that the funds disbursed after meeting key reform milestones will be used for investments in the electricity sector and not diverted for different purposes. The sub-account is also in line with the ongoing reforms of the Treasury Single Account (TSA) supported by the World Bank and IMF. The flow of funds under the IPF component will rely on existing country FM arrangements to manage donor-funded projects, which are centered around CAA and the Ministry of Public Procurement. These arrangements are centered on two main institutions.

Figure 5. Institutional Arrangements for the PforR and IPF



B. Results Monitoring and Evaluation

68. The PIU will have the primary responsibility for the monitoring and evaluation (M&E) of the implementation of the Program. The PIU will collect and consolidate relevant data from the implementing institutions to track progress toward achievement of the DLI results in quarterly reports. The results framework in Annex 1 will serve as a basis for establishing the tracking framework for implementation and building the M&E capacity within the ITC and staff of participating agencies. The PIU will hire an M&E specialist to track the achievement of results over time with the support of implementing institutions.

69. The PIU, under the guidance of the ITC, will hire an IVA, with ToRs acceptable to the World Bank, to verify the achievement of DLI results. The IVA will be financed by the IPF component of the operation following the World Bank’s procurement procedures. The IVA will be contracted within six months after Program effectiveness. The scope and details of the IVA reports will need to be satisfactory to the World Bank to disburse the allocated amounts.



C. Disbursement Arrangements

70. **Disbursements.** Under the PforR, disbursements will be made against achievement of DLI targets. An advance in the amount not exceeding EUR 49.166 million of the World Bank financing would be available for withdrawal at effectiveness. The Government will open an account at the Central Bank which will be a sub-account of the Treasury single account. All releases of DLI amounts will be done after review and verification of appropriate evidence by an IVA according to the agreed verification protocol. The DLR verification protocol includes definitions of agreed DLRs, baseline and target values, and procedures for measurement. Upon achievement (or partial achievement) of a DLR, the PIU will provide the World Bank and the IVA with evidence that the DLR has been met. Following review of the complete documentation and its verification report from the IVA, including any additional information considered necessary, the World Bank will send an official communication to the PIU as to the achievement of the DLR(s) and the level of financing to be disbursed against each particular DLR, including any partial disbursement for scalable DLRs where applicable. For scalable DLRs, applications for disbursements can be made annually to the extent the results are achieved and verified, and disbursements will be made in accordance with the applicable formulas. Any outstanding advance at the end of the Program will be returned to the World Bank. Under the IPF, the disbursement will be report-based. The activities supported by the IPF will include consultancy services, goods, capacity building, and operating costs. These activities will be subject to the World Bank's procurement, environmental and social framework, and FM policies and regulations.

71. **Prior results.** No prior results are expected under the Program.

D. Capacity Building

72. **Strengthening sector governance through capacity building and knowledge transfer activities to key sector stakeholders is a key feature of the PforR.** To support one of the Government priorities under the CESRP, the IPF component will support the creation of a technical training center (Center of Excellence) at the University of Ngaoundéré in the north of Cameroon. Based on the technical studies carried out by MINEE, the training center will aim to provide specialized on-the-job technical training to technicians in the electricity sector across the value chain, including regulation and project management.

73. **Enhancing ARSEL's capacity will improve sector efficiency and transparency.** The IPF component will support the regulator to fill three of the key gaps identified by the technical assessment: (a) obtain real-time operational and performance data from ENEO and SONATREL through an integrated regulatory monitoring database; (b) use updated benchmark prices of electricity materials and components for regulatory asset base calculations through a specialized database; and (c) enable the verification of ENEO's assets to be integrated in the regulatory asset base. First, the IPF component will finance the consultancy services that will commission the integrated regulatory monitoring database following the design financed under the ETRP. Second, the IPF component will also finance the commissioning and regular updates of a database with international and regional benchmark prices of electricity materials and components. Lastly, an engineering firm will support ARSEL in drafting a report on an updated physical inventory of assets in ENEO's concession.

74. **Increasing MINEE's capacity will improve the sector's planning and prevent overlapping responsibilities.** The IPF component will support the staff at MINEE in filling two of the key gaps identified by the technical assessment: (a) draft a high-level EMP, including annual targets, financing needs, and



electrification database and (b) prepare a Generation, Transmission, and Distribution Master Plan, for expansion and rehabilitation, reinforcement and upgrade of electricity generation, transmission and distribution infrastructure approved by MINEE substantially in the form of a final draft plan prepared in accordance with the technical views of the World Bank.

75. **Improving SONATREL's capacity will improve prioritization and implementation of key transmission projects.** The technical assessment identified the need for SONATREL to prioritize investments in rehabilitation and upgrade the existing transmission infrastructure as a low-hanging fruit to improve the quality of power supply in the short term to midterm. Thus, the ETRP will finance an updated business plan, including an investment plan for 2024–2028. The approval of the investment plan by ARSEL is a critical result in the PforR (DLR 7.1). The IPF component will support the participation of SONATREL staff in technical field visits and professional conferences abroad to learn about state-of-the-art issues that can contribute to acceleration of investment plan implementation.

IV. ASSESSMENT SUMMARY

A. Technical

76. **The Program will support key actions in the three defined RAs aimed to improve operational and financial performance of the electricity sector of Cameroon and help it achieve a condition of sustainable development.** Table 12 provides a list of eligible expenditures under the Program. On the one hand, actions to reduce tariff shortfalls and ensure regular payments by the GoC of decreasing subsidies and accurate bills for consumption of government agencies and public lighting will contribute to improving the financial condition of the sector, by ensuring its ability to collect revenues needed to cover costs across the entire value chain. Installation of solar PV generation aimed to reduce consumption of imported fuels will also help by reducing revenues required for operations. On the other hand, strengthening the monitoring of ENEO's performance, together with investments to improve the condition of infrastructure in the transmission and distribution segments, will help achieve better operational performance and quality of service delivered to consumers and enable grid electricity to more than 211,000 currently unserved households, hence benefiting about 1.1 million people.

77. **RA 1 (DLIs 1, 2, and 3).** Through DLI 1, the GoC will commit to a gradual reduction of compensation (tariff shortfall) as a percentage of MARs set by sector regulator ARSEL for the period of the PforR, assuming there are no significant differences between actual and forecasted values of key parameters of MAR (annual hydropower generation in each system, oil derivative prices, and amounts of energy generated by Nachtigal injected into the transmission system). Actions in DLI 2 will ensure regular payment by the GoC of accurate bills issued by ENEO for consumption of its agencies (representing 15–20 percent of annual turnover of the utility and the compensation to cover the gap between allowed electricity sector costs (determined by ARSEL through three MARs of regulated companies) and tariff revenues. Sub-DLI 2.1 will address accuracy and transparency of consumption metering in the GoC's facilities and public lighting through installation of smart meters in all the delivery points (around 15,000 public facilities and 150,000 public lighting lamps). A technical assessment will define optimum arrangements (minimum number of meters needed) to record public lighting consumption.

78. **RA 2 (DLI4).** Actions in DLI4 aim at achieving strengthened operational performance, enhanced accountability, and transparency of the sector. Execution of annual regulatory audits prescribed in ENEO's



concession contract will be key tools to allow ARSEL to comply with its core regulatory duty and ensure sustainability. ARSEL will also carry out technical audits of SONATREL’s performance. Audits will include identification of eventual deviations from expected performance and recommendations on how to address/correct them. In each annual audit, what was done to address recommendations from previous ones will be verified, and future determinations of MAR by ARSEL may be adjusted accordingly.

79. **RA 3 (DLIs 5 to 7).** DLI 5 tackles improvements in the quality of electricity service provided to existing consumers and connection of 211,000 new households to increase the overall electrification rate and the adoption of actions to systematize least-cost generation and transmission and electrification planning. DLRs 5.1 and 5.2, respectively, require that MINEE publish resolution approving the EMP and define the process to be adopted for systematic update of the Generation and Transmission Master Plan. DLI 6 tracks progress in increasing the share of renewable energy in electricity generation by supporting the installation of solar PV electricity generation capacity in sites of existing diesel fired thermal plants (“hybridization”), with the main purpose to reduce the load factor of those plants, significantly lowering high related operating costs and CO₂ emissions. It is expected that 44.66 GWh of solar PV generation will be added to the system over the duration of the program.

80. **DLI7** tackles the elimination of bottlenecks and other issues in the existing transmission infrastructure operated by SONATREL that affect the quality and reliability of transmission services, and limit electricity consumption of large users, despite the availability of sufficient generation capacity. To achieve this objective, DLR 6.1 requires that ARSEL approve a PIP of SONATREL, including an investment plan for rehabilitation and upgrade of the existing transmission infrastructure. As a minimum, the Program will target investments in the approved PIP aimed at increasing installed and available transformation capacity in the existing substations by at least 2 percent per year. To ensure enforcement of the PIP, DLR 6.2 requires the GoC and SONATREL’s Board to sign an updated performance contract, incorporating the plan as approved by ARSEL.

Table 11. Eligible Expenditures under the PforR Program

Tariff deficit/compensation
Investments in electricity distribution infrastructure, including the extension and rehabilitation of the network (15 kV and lower voltages) and new connections
Investments in the rehabilitation and upgrade of transmission solar PVs operated by SONATREL to improve service reliability and remove bottlenecks to supply existing demand, spare parts, and O&M equipment
Investments in solar PV generation plants to reduce the load factor of existing thermal plants
Investments in smart meters and energy efficiency for public buildings and streetlighting

81. **The Program will contribute to improving gender parity within the energy sector through an internship scheme—financed through the IPF component—targeting women in STEM.** Aimed to enable women to gain work experience in technical internship positions across the different institutions of Cameroon’s energy sector, this proposed approach will help alleviate existing challenges and bottlenecks of internships identified during a thorough assessment at key institutions.

82. **This operation is aligned with the goals of the Paris Agreement on both mitigation and adaptation.** Successful implementation of the operation will enable increased resilience of the country through increasing access to electricity, better financial sustainability in the energy sector, and strengthen institutional framework in the energy sector. **Assessment and reduction of mitigation risks:** The activities under the operation are either universally aligned with the mitigation goals or considered to have a low



risk of negatively impacting the country's low-GHG-emissions development pathways. The following activities are on the list of universally aligned activities: installation of smart meters (DLI3), increasing energy access (DLI5), support for solar energy generation (DLI6), electricity transmission (DLI7). As 74 percent of the electricity consumed in the country is generated from hydropower, DLIs 1, 2 and 3 are considered low risk as they are improving the financial viability of the sector, which includes this renewable energy in the electricity mix⁵⁸. DLI4 is improving governance and transparency in the sector, which is also considered low risk. IPF activities supporting these DLIs through capacity building, coordination support, technical support, etc. are also considered aligned. During implementation, it will be ensured that mitigation risks for the Center of Excellence are assessed, in line with the World Bank's Paris Alignment methodology, and reduced to a low level through appropriate energy efficiency and green design measures. This will be included in the Program Operations Manual (POM). Please refer to Annex 3 for more details. **Assessment and reduction of adaptation risks:** As explained in Annex 10, the main climate change and natural hazard risks are wildfire, flooding and extreme heat. While the operation itself does not make direct investments to support large-scale generation and new transmission infrastructure, it addresses sector fundamentals, which will have a positive effect in expanding generation capacity and building transmission infrastructure in the future. The operation will also strengthen communities, households and institutions through increased access to electricity and the systems and management structures that enable it. Increasing energy access is also central to economic development which itself has direct ties to increased community strengthening. During implementation, it will be ensured that adaptation risks for the Center of Excellence are assessed, in line with the World Bank's Paris Alignment methodology, and reduced to an acceptable level through appropriate climate resilience measures. This will be included in POM. Therefore, it can be concluded that adaptation risks for the operation have been reduced to an acceptable level.

B. Fiduciary

83. **The Government's program fiduciary system encompassing procurement, FM, and governance has been assessed by the World Bank against the operational requirement outlined in the PforR Financing Framework.** The Integrated Fiduciary System Assessment (IFSA) assessed whether the fiduciary system and performance of the Program's fiduciary system are adequate and provide reasonable assurance that the funds would be used for the intended purposes with due attention to the principles of economy, efficiency, effectiveness, transparency and accountability. The IFSA concluded that the Program's fiduciary systems have the capability of providing reasonable assurance that the financing proceeds will be used for intended purposes with the objective of supporting the achievement of the Program objectives and with due attention to the principles of economy, efficiency, effectiveness, transparency, and accountability.⁵⁹ The IFSA has also identified potential risks, the fiduciary risk is rated Substantial, and areas for further strengthening and the proposed mitigation measures are listed in the Program Action Plan (PAP). The Program will adhere to "Guidelines on Preventing and Combating Fraud and Corruption in Program-for-Results Financing," dated February 1, 2012, and revised July 10, 2015.

⁵⁸ In 2022, 74 percent of the electricity generated was from hydropower and 26 percent from thermal sources.

⁵⁹ Section III. 8 of the World Bank Policy: Program for Results Financing.



84. **Key fiduciary risks.** The key fiduciary risks under the Program include (a) uncompleted set up of the TSA⁶⁰ and persistent liquidity tensions; (b) limitation of the Chamber of Account resources and independence to audit the government accounts; (c) fragmentation of fraud and corruption risk management, unclear leadership role assigned, and weak coordination of several institutions⁶¹ charged with mission to prevent and respond to fraud and corruption; (d) limited capacity of the MINEE internal audit and lack of modern audit tool to carry out risk assessment and risk-based audit; (e) lack of capacity of key procurement actors (members of procurement committees and bid analysis subcommittees); (f) poor quality of procurement documents which generally leads to unsuccessful tenders; (g) governance issues that lead to an increase in the number of complaints during the procurement process and consequently to a more cumbersome contract award process; and (h) Lack of capacity in contract management. On the positive side, (a) the CoA, although not familiar with the PforR and the audit of the World Bank-financed projects, has audited the government accounts on time with the report approved by the Parliament before the deadline and published on the government website. The CoA has audited some African Development Bank-financed investment projects⁴; (b) National Anti-corruption Commission (NACC) has regularly published its annual reports on its website⁵ to inform on allegations of fraud and corruption.

85. **Mitigation measures.** To mitigate the risks identified, the Program's design proposed the following measures:

- (a) The Government has proposed to open at the Central Bank a TSA sub-account into which the World Bank contribution will be released. This sub-account will be managed by the Treasury. The Government has proposed to use in priority the resources in the sub-account to finance the program activities. A similar arrangement was made for the Cameroon Electricity Sector Development Funds created by the Government with resources provided by key electricity operators and the government.
- (b) The annual external audit of the Program will be conducted by the Chamber of Accounts⁶ with ToR acceptable to the World Bank. Provisions would be made in the program to support the CoA to deliver quality output and on time.
- (c) The National Anti-Corruption Commission is a public independent body invested with the principal mission to contribute to fight against corruption. The World Bank will sign a Memorandum of Understanding (MoU) with the CELCOR/MINEE, a devolved entity of the NACC, to ensure that any allegations on fraud and corruption in the Program are reported timely. CELCOR/MINEE will be responsible for coordinating the investigation of any potential fraud and corruption case that might arise during the Program execution. Provisions will be made in the program to support CELCOR/MINEE as well and other institutions involved in preventing and addressing fraud.

⁶⁰ The Government has a timeframe 2022-2024 for the implementation of the TSA. The TSA is not yet fully operational and does not include all the government financial resources. In addition, cash management is weakened by exceptional fund management procedures due mainly to extra-budgetary expenditures. The government tested the new Information and Communications Technology (ICT) platform developed by the Central Bank for TSA management since late 2022. The new TSA is to be launched in June 2023. The first year for which TSA budget execution reports will be available will be 2024.

⁶¹ These include National Anti-Corruption Commission (*Commission Nationale Anti-Corruption*, CONAC), National Agency for Financial Investigations (*Agence Nationale d'Investigation Financière*, ANIF), Chamber of Accounts (*la Chambre des Comptes*), Supreme State Audit Office (*Contrôle Supérieur de l'Etat*, CONSUPE), Special Criminal Tribunal (*Tribunal Criminel Spécial*, TCS), Public Contracts Regulatory Agency (*Autorité de Régulation des Marchés Publics*, ARMP), Ministry of Public Contracts (*Ministère des Marchés Publics*, MINMAP).



- (d) The Program will include support activities through Technical Assistance to support capacity building of the General Inspectorate of the MINEE to carry out risk assessment and risk-based audits.
- (e) With the recent approval of the procurement capacity development strategy, the Government has undertaken, with the assistance of the Strengthening Public Sector Effectiveness and Statistical Capacity Project (P151155; *Projet d'Amélioration de l'Efficacité de la Dépense Publique et du Système Statistique*, PEPS) some steps to implement the strategy for all actors involved in the procurement process and contract management. Such training will benefit the procurement staff involved in the implementation of the Program.
- (f) The Government has approved that existing standard procurement documents, manuals and guides developed with World Bank support under PEPS will be used during implementation of the PforR.
- (g) Gradual implementation of the Cameroon online e-procurement system (COLEPS), and reduction of bad practices observed and improvement of the performance of the public procurement system through (i) strengthening the performance-based financing mechanism throughout the country; (ii) establishing and disseminating a code of ethics; (iii) fighting corruption and strengthening integrity in the public procurement management process; (iv) dematerializing all public procurement management procedures; and (v) reviewing the regulatory framework for the appointment of public actors

86. The overall fiduciary residual risk is rated Substantial.

C. Environmental and Social Safeguards

87. **The proposed PforR would have positive environmental and social impacts.** It would reduce electricity consumption in public buildings and public lighting and thermal generation. The phaseout of diesel for power generation, reduction of electricity consumption, and investment in solar power generation will contribute to the reduction GHG emissions in the country. Thus, the Program would also contribute to improving access to electricity through last-mile connections and would enable the poor and most vulnerable and disadvantages peoples (including indigenous populations) to benefit from improved access to affordable electricity. Moreover, achievement of the Program's financial sustainability will improve the quality of electricity supply to households and businesses and would create job opportunities. The improved financial and operational transparency would help enhancing citizens' trust and improve regular electricity bill payments.

88. The Environmental and Social System Assessment (ESSA) found that the Environmental and Social (E&S) risks are **Substantial**. They are related to the potential impacts of the works and reforms to be financed under the PforR. Works comprise upgrades in existing HV substations to increase their capacity, new electricity connections, hybridization of existing thermal generation facilities with solar PV and supply to isolated systems to serve currently unelectrified areas, smart meters for public buildings and public lighting and rehabilitation and extension of distributed networks operating at 15 kV or lower voltages (densification) and service connections. Works to be executed for that purpose are usually identified as "grid densification" and include the construction of distribution networks components in urban and peri-urban areas currently having medium voltage (15 kV) lines.



89. Construction of 15 kV and low voltage lines is in general made at the side of public ways, without requirements on rights of way. Usually, the same poles for both lines are used and to mount medium to low voltage distribution transformers. If small capacity distribution transformers supplying few customers are used (US network topology), LV networks are short and it is economic to build them using twisted cables, which is very resistant to weather events and external aggressions in general, while also creating a less risky condition if it fall to the ground.

90. Grid densification could also include construction of a few 15 kV service drops to connect at this MV level buildings of factories, which will be required to build inside their premises at their cost their own MV/LV substation. These works range from low to medium in magnitude, they are site specific, and others are located along existing roads.

91. The E&S risks and impacts are mostly likely temporary, reversible and they can be mitigated in a predictable manner. The potential environmental risks of works are the generation of electronics and e-waste that may affect the natural environment and public health. Replacement of poles of public lighting and installation of public lighting can involve minimal ground disturbance, including some occupational health and safety risks, such as electrocution and falling from heights. There will be also risks related to procurement of non-energy-efficient IT equipment and meters.

92. Social risks and impacts include a lack of adequate and timely stakeholder engagement (access to public information, consultation and concerns and grievances redressing), particularly for non-governmental actors. Provisions allowing citizens to provide their feedback in the public sphere is very limited and usually formal within environmental and social impacts assessments, and citizens feedback is not considered; small but potential disruption of economic activities caused by works of extension of distributed networks operating at 15 kV or lower voltages (grid densification, low-voltage distribution lines and associated low-voltage distribution transformers - usually small-sized mount on poles situated along existing roads, requiring no land clearing and physical displacement) service connections and the upgrade of existing substations (replacement of existing equipment by more performant ones).

93. The “hybridization” of thermal plants, and has clear economic advantages, as well as reduction of local pollution and of CO₂ emissions. Installation of solar PV generation capacity does not imply any construction works outside the existing plant site.

94. **As regards social impacts of tariff reforms, gradual tariff adjustments are on-going and target MV customers and large accounts, and not households. on the final consumers, and are already on course.** However, the cumulative impact of the planned gradual tariff increase until 2026, could have an impact downstream to end customers, particularly on most disadvantageous and vulnerable social groups. of the tariffs for these categories of customers on a year basis until year 2026 can cascade down and impact negatively the final customers, and most disadvantageous or vulnerable social groups can be affected particularly if this is not adequately assessed. Before the implementation of the first part of the reform, ARSEL which is the regulatory agency carried out a study on the impacts of the first tranche (2022-23) of tariff reforms on the price of final products of targeted industries. the industry related to years 2022/2023. However, the following gaps have been identified: (a) the cumulative impacts of the increases until 2026, and (b) the distributional impact on different social groups. is not considered. To inform the overall reform process and strengthen ARSEL’s regulatory capacity, the preparation of a Poverty and Social Impact Assessment (PSIA) will be carried out.



95. **Additional gap-filling measures have been included in the ESSA’s action plan to ensure that the Borrower’s Environmental and Social Management System (ESMS) is adequate to manage the potential environmental and social risks and impacts.** While the country has a well-established legal framework for environmental management related to the expected results of the Program, the capacity for social risk management is low. This includes low capacity for managing livelihood’s restoration and social participation in policy decision-making. There are no systematic mechanisms in place to foster transparency, social control, and accountability. No changes to the E&S legal or regulatory framework are needed before the operation can proceed.

96. **A Social and Environmental Management Action Plan was agreed for implementation of the PforR.** The action plan will be implemented throughout the Program life cycle and comprises the specific measures with timeline and responsible, including linkages with the DLIs as summarized in Annex 5. All sub projects will be selected and agreed upon on an annual basis. MINEE will submit its proposed investment list to the World Bank on a yearly basis. The Annual Investment List will include the E&S screening of each proposed infrastructure work by the MINEE based on the PforR exclusion criteria (See Table 4). MINEE will also submit all relevant documentation to the World Bank to conduct an additional due diligence to confirm compliance with the exclusion criteria and, provide its no-objection on the list. The World Bank will be assisted on this by IVA. Alongside this screening, specific measures are recommended and required to ensure adequate management of the envisaged E&S risks, including: (a) enhancement of the environmental and social capacity in the implementing agencies by creating dedicated environmental and social units and improving staffing and procedures; (b) preparation of an ESMS to be implemented throughout the program; (c) Preparation of a PSIA; (d) a robust strategy for continuous stakeholder engagement; (e) Strong communication plan of the program; and (f) an efficient grievance redress mechanism (GRM). This action plan, distinct from the environmental and social risks related to the IPF component, will be monitored and reported and financed by the IPF component. ESMS will include specific chapters on the following: (a) protocol to apply resource efficiency technologies and acquisition of sustainable equipment (meters and cables); (b) a protocol to manage waste and improved E&S impact assessment and planning to be included in the environmental and social management framework; (c) a labor management procedure focusing on occupational and health and gender based violence; (d) livelihood’s restoration; and (e) coping strategies to manage social impacts of the reforms in the sector according to the results of the PSIA.

97. **Information disclosure and stakeholder consultations carried out in association with the PforR.** The draft ESSA Report was disclosed on June 6, 2023. Consultations that were carried out by the World Bank’s staff with key stakeholders during the Program’s preparation will continue throughout the implementation. The ESSA consultation plan includes governmental electricity sector agencies, experts in the energy sector, and nongovernmental organizations. The operation will continue to engage stakeholders through information disclosure, communication, and grievance redressing, as foreseen in the Stakeholder Engagement Plan (SEP)⁶² that was prepared for the Program and the Project and disclosed in-country on June 13, 2023, and on the World Bank’s website on June 7, 2023. Environmental and Social Commitment Plan (ESCP) was disclosed in-country on June 13, 2023, and on the World Bank’s website on June 7, 2023⁶³.

⁶² <https://minee.cm/en/category/pforr/>

⁶³ Re-disclosed on June 27, 2023.



98. **Citizen engagement.** The project includes customer feedback as part of the M&E system for the assessment of electricity customer satisfaction (both household and industrial) with the service provided by ENEO. Collection of this feedback will start no later than the third year of implementation, by which point the positive feedback loop of financial viability and improved operational performance of the sector will be measurable and should be translated by an increase in customer satisfaction both in quality of service and speed with which troubleshooting is handled by ENEO. Feedback from customers, including from the GRM supported through the project, will be made public to enhance accountability and transparency. Citizen engagement will also be ensured through the communication plan – part of the SEP of the operation, which will also support community-based awareness raising campaigns to strengthen citizen engagement in the operation through different channels.

IPF Component

99. **The environmental and social risk rating of the IPF component is Moderate.**

100. **The main environmental and social risks, as directly associated with the IPF component, are mostly potential downstream negative impacts of studies and plans.** Social risks include (a) inadequate management of human resources for project workers and possible sexual exploitation and abuse/sexual harassment (SEA/SH) in the work and communities' environment comprising the PIU, IVA, owner's engineer, and other contractual workers; (b) inadequate stakeholder engagement, including grievances management; and (c) potential downstream social negative impacts of plans and studies, when they are implemented. On the environmental side more specifically, the risks include occupational health and safety risk related to the construction of a training center (Center of Excellence), and the generation of waste products from construction and e-waste that may affect the natural environment.

101. **To avoid, minimize, or mitigate these potentially negative impacts, the Borrower, with the support of the World Bank, shall**

- (a) Ensure that the ToR for the preparation of the studies, plans, and other activities being supported by the IPF component incorporate the principles and requirements set out in the World Bank's Environmental and Social Standards (ESS) 1–10. The World Bank's environmental and social specialists will review and provide 'no objection' to such ToRs and outputs;
- (b) Strengthen stakeholder engagement, through public disclosure and consultations, around the proposed activities supported by the IPF component. The SEP was disclosed on the World Bank's website and the Government's site before appraisal;
- (c) Establish, publicize, maintain, and operate an accessible grievance mechanism within 30 days of the effective date of the operation⁶⁴;
- (d) Prepare a Labor Management Plan with suitable measures to avoid and address any Gender Based Violence (GBV): SEA/SH in the work environment and communities and a GRM for workers within 60 days of the project's effectiveness;
- (e) Prepare, consult, disclose, adopt and implement an Environmental and Social Management Plan for the construction of the center of excellence, consistent with the relevant ESSs, including GBV: SEA/SH management, no later 60 days of project effectiveness.

⁶⁴ GRM was adopted on June 5, 2023, and will be operationalized prior to the effectiveness.



D. Gender

102. **Widely regarded as one of the least gender diverse parts of the economy, women in the energy sector account for only 22 percent of the labor force in the oil and gas sector and 32 percent in renewables, and representation in utilities is low for women in all roles (3–25 percent) globally.** An initial gap assessment in key Cameroonian institutions (ARSEL, AER, MINEE, and SONATREL) showed that although there are some progressive measures, the percentage of women, particularly in technical positions, remains low with only about 5 percent in some of institutions, owing largely to the weak pipeline of technical female staff joining energy sector institutions, the general lack of dedicated policies for recruitment and employment, and a lack of established pathways to career advancement within the sector (see details in Annex 9).

103. Given that all participating institutions are supportive for a more strategic approach toward channeling female STEM talent into the energy sector, a targeted internship program was proposed and elaborated through additional analysis. This assessment established that while there is generally a balanced proportion of female and male interns at the key institutions, women are underrepresented in technical internships at only 15 percent. In addition, strategy was found to be lacking when it comes to level, duration, and specialization of internships, stemming from the voluntary/non-remunerated posts and generally ad hoc nature of admissions. Also, most internships do not facilitate recruitment into the host institution or elsewhere, with less than 5 percent of interns accessing jobs in the energy sector following their internships, mostly due to the lack of administrative follow-up and personalized tutoring.

104. The operation therefore proposes to formalize admittance through a centralized application system based on institutional needs for study level and specialization, make entries more competitive, and subsequently remunerate interns. It also proposes some internship positions for female staff for career development (see Annex 9). Internships would last for six months to allow sizeable work experience, either at the same institution or at two different ones at three months each. The interns will benefit from additional mentoring and trainings to increase their opportunities for recruitment, assisted by MINEE and civil society partners, particularly the 'Women's Association for the Energy and Water Sector (*Synergie Féminine pour l'Energie et l'Eau*, SYFEE). Indicators will track the percentage of women in technical internships with a 30 percent target, compared to the current 15 percent baseline, and also the percentage of women accessing energy sector jobs or promotions following internship with a target of 20 percent from the current 5 percent.

E. Economic Analysis

105. The economic viability of the Program is assessed through a cost-benefit analysis. Net benefits for the Program were calculated by comparing total system costs and benefits for the 'with Program' and 'without Program' scenarios. A range of scenarios and sensitivities that meaningfully reflect the uncertainties of key input variables are evaluated. The analysis includes a consideration of the relevant environmental externalities.

106. The Program covers a range of power sector reforms, which results in the benefits detailed in the following paragraphs.



(a) *Increased efficiency of public lighting (DLI 3)*

107. One of the objectives of DLI 3 is to improve the metering of public administration and public lighting consumption while introducing energy efficiency measures that will reduce overall consumption and facilitate the timely payment of invoices by the Government. The Program will supply public lighting with functioning meters and LED lamps that will replace incandescent lights in streets and public buildings. The economic analysis captures the reduction in energy demand and GHG emissions as a result of these measures. The analysis considers a total investment of US\$25.6 million. Considering a usage of eight hours per day will enable the installation of 8.5 MW in LED bulbs. For this analysis, the costs of streetlight replacement are US\$3 per W, including installation, disposal, and metering, and the lifetime is five years.

(b) *Increased access to electricity for residential customers (DLI 5)*

108. The Program increases electricity access by providing 211,000 additional connections in urban and rural areas. The analysis considers that the capital costs per new connection are US\$500. The variable costs of electricity access relate to the costs of service and the economic benefits of electricity access are estimated using the customers' willingness to pay (WTP) for electricity. The WTP is inferred by estimating the cost of available alternatives currently used by prospective customers. This ranges from US\$0.16 per kWh in rural areas to US\$0.3 per kWh for self-generation using diesel in urban areas. A value of 0.18 is used in this analysis and given the uncertainties in the WTP, a sensitivity analysis is performed.

(c) *Expansion of solar PV capacity through hybridization of diesel thermal systems (DLI 6)*

109. The Program considers updates in the Generation and Transmission Master Plan to maximize the share of renewable energy in the east and north electricity systems to reduce carbon emissions and generation costs. Given the availability and use of diesel generators, solar-hybrid systems consisting of new solar PV systems integrated with existing diesel generators are an economical configuration for continuous power access. Furthermore, this solar-hybrid configuration helps reduce the negative health and environmental impact on society compared to using diesel generators alone. The Program will replace thermal generation by (i) enabling 22 MW of new solar PV generation capacity and (ii) expanding access to clean hydropower.

(d) *Increased access to electricity for industrial customers (DLI 7)*

110. Under DLI 7, SONATREL implements investments to eliminate bottlenecks in the existing transmission systems to enable an increase in the industrial electricity consumption from the grid. By enabling industrial customers to connect to the grid, the Program targets the displacement of 613 GWh of thermal electricity consumption over a four-year period. This will reduce the fuel/variable costs of thermal self-generation, which are about US\$0.2 per kWh. The capital investment needed to supply power to industrial customers is estimated to be US\$76.2 million over four years.

111. **GHG emission reductions.** The Program results in relevant GHG emission reductions as a consequence of the various interventions. The analysis includes the following:

- (a) **Solar PV:** GHG reductions due to the displacement of diesel generation with solar PV



- (b) **Increased electricity access to residential households:** GHG reductions due to the displacement of diesel generation and kerosene with electricity from the grid having lower GHG intensity
- (c) **Access to industry to grid-supplied electricity:** GHG reductions due to the displacement of diesel from self-generation, with grid-supplied electricity
- (d) **Public lighting:** Reduced generation due to the replacement of incandescent lights with LED lights.

112. **The economic analysis shows that the proposed Program is economically viable both with and without consideration of GHG externalities.** The economic rate of return (ERR) is 35 percent without the consideration of environmental externalities. If GHG emissions are considered, the ERR increases to 40 percent. The net present value (NPV) of the Program without environmental externalities is US\$744 million. With GHGs, it increases to US\$900 million. The lifetime emission reductions are 6.0 mtCO_{2e}.

F. Financial Analysis

113. **A financial analysis was conducted for the Program to show the impact of implementing the agreed reform actions on the financial health of the sector.** The analysis is focused on DLIs where the financial cash flows are easily quantifiable as a result of achieving the agreed results—DLI 1, DLI 3, DLI 5, DLI 6, and DLI 7.

114. The financial analysis shows that applying cost-reflective tariff rates to MV customers of ENEO (except those classified by the GoC as socially sensitive) and HV customers (except ALUCAM) will have the impact of (a) increasing total revenues in the sector by US\$178 million between 2024 and 2027 and (b) reducing the sector shortfall, which in turn will reduce the amount of subsidies that will be paid by the GoC to the electricity sector (DLI 1). Ensuring the implementation of timely payment of government bills (own consumption, any tariff compensation, and public lighting) will reduce the number of days it takes for ENEO to receive collections from its customers by 47 percent (that is, a reduction from 224 days to 118 days). This would also improve ENEO's working capital by 76 percent or US\$176 million over the Program period and reduce the liquidity crunch that the company currently faces (DLI 2).

115. Through the addition of renewable energy generation capacity (solar PV) of 22 MW over the life of the Program under DLI 6, the sector has a reduction of 3 percent (or US\$54 million) in generation costs related to the use of fossil fuel-based generation because solar PV will displace the use of diesel in the remote areas. With an investment of US\$76.2 million over the life of the Program in DLI 7, SONATREL would be able to reduce existing bottlenecks in the transmission system, enabling an estimated increase of 613 GWh in consumption by industrial electricity customers from hydro-based generation in RIS. This would provide an improvement in the system revenues of US\$84 million.

V. RISK

116. The overall risk for the Program is rated Substantial.

117. **Political and Governance risk is rated High.** Cameroon continues to rank poorly on governance indicators (particularly procurement and public financial management) and corruption remains pervasive despite a greater push for decentralization by development partners. In 2019, the Government launched



an ambitious public financial management reform program, which is expected to yield fruit in the coming years. The successful implementation of a Government program in Cameroon requires a high level of coordination between several government administrations including at the highest levels of government. Decision-making is highly centralized at the levels of the Presidency and Prime Minister, and past successful reforms have been a result of strong high-level oversight using Interministerial Committees to ensure sufficient coordination. In addition, stakeholder political interests are often divided, with some level of politicization at the top management levels of state-owned enterprises with some negative impact on the level of governance at those institutions. To mitigate this risk, the program will rely on the high-level strategic ITC created to ensure ownership of the Government program and build a broad consensus on the required reforms.

118. **Macroeconomic risk is rated Substantial.** Cameroon's economic recovery following the COVID-19 crisis was supported by the GoC's commitments to fiscal consolidation and reduced external imbalances of the IMF program under the Extended Credit Facility and the Extended Fund Facility (2021–2024) and the World Bank Development Policy Operations (2022–2025)⁶⁵. Nevertheless, the increase in current expenditures on fuel subsidies to keep prices at pumps constant has reduced the fiscal space further, prompting the GoC to cut down on capital expenditures. Against this background, in January 2023, the authorities decided to let retail prices increase by up to 21 percent to reduce the size of the bill on fuel subsidies. A new external shock would put the Government's cash flows under further strain, compromising its ability to clear existing arrears and new bills toward energy providers without delays.

119. Public debt has increased in recent years due to higher borrowing and disbursement on non-concessional terms and the recent depreciation of the CFA franc against the US dollar. The country is then expected to face higher debt servicing costs that would weigh on its fiscal and external positions if revenue collection does not improve concomitantly. To help boost revenue collection and maintain external balance, Cameroon entered a three-year program with the IMF (2021–2024) and will benefit from technical assistance by the World Bank on revenue administration, exports revenues accounting, and tax compliance. Public financial management should also improve with the support of the World Bank Development Policy Operations, as a decree authorizing digital payments from the governments to people has been issued in 2022 to streamline payments, reduce transaction costs, and avoid mismanagement. Such measures should help build buffers and provide the Government with more fiscal space to meet its commitments toward the energy sector.

120. **Sectoral Strategies and Policies risk is rated High.** Cameroon's energy sector faces shortcomings in enforcement of existing regulations and policies and sector planning. There is a multiplicity of actors with overlapping interventions in various areas of the sector, for example, transmission infrastructure, investments to increase access rate, and so on. This leads to inefficiencies in sector performance and delays in the availability of transmission and distribution infrastructure necessary for the evacuation of power from Nachtigal and to increase consumption, which undermines the sustainability of results. The potential inability of the sector to immediately absorb all of the energy to be produced from Nachtigal from 2024 onwards creates additional risk for the financial sustainability of the sector with associated fiscal burden. As a mitigation measure, the PforR emphasizes the need for improved sector wide planning through preparation of a Power System Master Plan and EMP. The PforR also supports investments in

⁶⁵ This includes the recently closed Cameroon First Fiscal, Inclusive and Sustainable Growth Development Policy Financing (P175249) and the Second Fiscal Sustainability, Inclusive and Sustainable Growth Development Policy Financing (P180017) under preparation.



distribution and transmission that will improve the absorption of energy from Nachtigal by industries who currently self-generate electricity through expensive thermal sources. The regulator ARSEL is only moderately empowered to efficiently regulate the activities of ENEO, SONATREL, and EDC due to lack of IT systems needed to timely collect and process data on performance of the companies and limited capacity to carry out its key activities. This is mitigated through the capacity-building support provided by the IPF component.

121. The distribution sector is underperforming in the hands of a private operator, ENEO. Distribution efficiency improvements at ENEO are essential for the sustainability of overall sector reforms. The US\$320 million capital expenditure financing being arranged by IFC has been stalled due to uncertainty regarding the future ownership of ENEO. ENEO has resorted to refinancing and upsizing its existing debt from local commercial banks (from XAF 100 billion to XAF 150 billion) to cover its immediate financing need. To mitigate the risk associated with underinvestment in the distribution sector, the PforR Program's expenditure is designed to allow certain distribution investments as allowable expenditures. The World Bank continues to closely coordinate with IFC and MIGA management on possible future private investments in ENEO depending on the decision on ownership of the company. The PforR is also designed to strengthen and empower ARSEL to efficiently regulate the activities of ENEO and monitor its performance through the KPIs in its concession contract. The proposed Program will also rely on the ownership of the ITC to mitigate the risk of insufficient coordination between MINEE and MINFI.

122. **Technical Design of Program risk is rated Substantial.** This PforR instrument will be used for the first time in the energy sector under the proposed operation. There is a lack of familiarity with the modalities of the instrument despite some similarities with the budget operation with which the GoC is more acquainted. Nevertheless, the government has begun preparing an action plan for the implementation of activities that will result in the achievement of DLRs to mitigate technical risks. Some of the key activities of the proposed operation represent improvements of what is already being implemented within the sector, for example, determination by the regulator of an annual allowed requirement for sector companies, development of a sector master plan and national electrification plan, and so on. These are standard sector practices that do not require a high level of innovation. However, the mechanism for enforcement of the tariff methodology and the requirement for the Government to commit to regular payments of bills for public administration consumption, tariff compensation and public lighting may require more hand holding of sector stakeholders. Moreover, tariff adjustments of any scope and amount are sensitive from a socio-political stance even though the Government has begun taking steps toward tariff adjustments for large MV consumers with the issuance of a new tariff order in December 2022.

123. **Institutional Capacity for Implementation and Sustainability risk is rated Substantial.** Following the series of institutional reforms in the energy sector, the GoC has relatively young public companies (SONATREL and EDC), whose capacity is still being strengthened. Shortcomings exist in governance, policies, and implementation of ongoing projects. Management appointments are also often influenced by political decision-makers. The regulator ARSEL has solid technical competence but is somewhat limited in its regulatory capacity due to the lack of enforcement and inadequate technological capacity. The private distribution concessionaire has reputable institutional shareholders, including the GoC, but a poor operational performance over the past two decades. Gaps in its internal governance and capacity as a distribution utility contribute to its performance being below expectations. The institutional risks are mitigated by the track record of MINEE, SONATREL, and EDC in implementing access, transmission, and



renewable generation projects, respectively, even though they have not been without challenges. The technical assistance component will support the services of consultancies (for example, owner's engineer or consultancy firms) necessary for the successful implementation of agreed reform actions.

124. **Fiduciary risk is rated Substantial.** Key risks include uncompleted set up of the TSA² and persistent liquidity tensions could result in significant delays to respond to requests or payments submitted by MINEE for the Program activities, limitation of the CoA resources and independence to audit the government accounts, fragmentation of fraud and corruption risk management with unclear leadership role assigned and weak coordination of several institutions³ charged with mission to prevent and respond to fraud and corruption, lack of capacity of key procurement actors (members of procurement committees and bid analysis subcommittees), poor quality of procurement documents (tender documents and tender evaluation reports) which generally leads to unsuccessful tenders, and governance issues that lead to an increase in the number of complaints during the procurement process and consequently to a more cumbersome contract award process; and Lack of capacity in contract management. Proposed mitigation measures include a set-up of a TSA sub-account into which the World Bank contribution will be released, and use in priority to finance the program activities, annual external audit of the Program will be conducted by the CoA⁶ with ToR acceptable to the World Bank and provisions would be made in the program to support the CoA to deliver quality output and on time, a MoU between the World Bank and the National Anti-Corruption Commission to coordinate and report allegations on fraud and corruption in the Program, the Program will support the capacity building for all actors involved in the procurement process and contract management. In this regard, the Government has undertaken, with the assistance of the World Bank, to implement the procurement capacity development strategy for actors involved in procurement management process, and gradual implementation of the COLEPS.

125. **Environment and Social risk is rated Substantial.** Environmental risk is rated Moderate for both PforR and IPF component. While the social risk is rated as Substantial for the PforR and Moderate for the IPF component The social risks of the PforR are related to the potential impacts of the works and reforms to be financed under the PforR. Works comprise capacity increase of HV substations, new distribution connections, hybridization of existing thermal generation facilities and supply to isolated systems to serve currently unelectrified areas, smart meters for public buildings and public lighting and rehabilitation and extension of distributed networks operating at 15 kV or lower voltages (densification) and service connections. Works to be executed for that purpose are usually identified as "grid densification" and include the construction of the following distribution networks components in urban and peri-urban areas currently having medium voltage (15 kV) lines. This risk classification is also based on the social safeguard performance of projects implemented by the client. The average social safeguards performance of these projects during the past two years is moderately satisfactory.

126. Under the operation, appropriate mitigation measures are put in place to anticipate and avoid, minimize, mitigate and compensate negative impacts of the Program, in line with the mitigation hierarchy. These measures include: (a) Annual screening of subprojects submitted by MINEE by the IVA in line with an agreed exclusion criteria list; (b) The preparation and implementation of an ESMS addressing gaps identified in the national E&S system. MINEE will also submit all relevant documentation to the World Bank to conduct an additional due diligence to confirm compliance with the exclusion criteria and, provide its no-objection on the list. Detailed selection criteria, conditions, and procedures for the selection of the infrastructure works for inclusion under the program will be included in the ESMS and reflected in POM. Alongside this screening, specific measures are recommended and required to ensure adequate



management of the envisaged E&S risks. These specific measures are outlined in the action plan inserted in Annex 6.

VI. WORLD BANK GRIEVANCE REDRESS

127. **Grievance Redress.** Communities and individuals who believe that they are adversely affected as a result of a World Bank supported PforR operation, as defined by the applicable policy and procedures, may submit complaints to the existing program grievance mechanism or the World Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address pertinent concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of World 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 at any time after concerns have been brought directly to the World Bank's attention, and World Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's GRS, please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank's AM, please visit <https://accountability.worldbank.org>.



ANNEX 1. RESULTS FRAMEWORK MATRIX

Results Framework

COUNTRY: Cameroon

Cameroon Power Sector Reform Program

Program Development Objective(s)

The Program's Development Objective is to improve financial performance and transparency of the electricity sector, and increase access to electricity in Cameroon.

Program Development Objective Indicators by Objectives/Outcomes

Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
Improve financial performance of electricity sector						
Reduction of annual revenue gap between maximum allowed revenues and tariff revenues (Percentage)		9.50	9.50	7.00	6.00	5.00
Timely payments of public administration's electricity consumption and annual compensation (Text)	DLI 2	Irregular payments of annual compensation and electricity bills of public facilities	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2024 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2025 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2026 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2027 has been paid by MINFI in quarterly disbursements made no later than three months after the end of



Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
			quarter; (b) (i) 70% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2024, and (ii) 100% of the budgeted amount for central government's electricity bills estimated by ARSEL for year 2024 have been paid by the end of the first quarter of 2025.	quarter; (b) (i) 80% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2025, and (ii) 100% of the budgeted amount for central government's electricity bills estimated by ARSEL for year 2025 have been paid by the end of the first quarter of 2026.	quarter; (b) (i) 90% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2026, and (ii) 100% of the budgeted amount for central government's electricity bills estimated by ARSEL for year 2026 have been paid by the end of the first quarter of 2027.	each quarter; (b) (i) 100% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2027, and (ii) 100% of the budgeted amount for central government's electricity bills estimated by ARSEL for year 2027 have been paid by the end of the first quarter of 2028.
Improve transparency of electricity sector						
Public disclosure of annual audits of ENEO and SONATREL performance reports (Text)	DLI 4	Absence of systematic regulatory audit of performance of ENEO and SONATREL	ARSEL has published a report on technical audit of performance of ENEO and SONATREL in previous year	ARSEL has published a report on technical audit of performance of ENEO and SONATREL in previous year.	ARSEL has published a report on technical audit of performance of ENEO and SONATREL in previous year.	ARSEL has published a report on technical audit of performance of ENEO and SONATREL in previous year.
Increase access to electricity						
People provided with new or improved electricity service (CRI, Number)		0.00	0.00	230,000.00	480,000.00	1,055,000.00
People provided with new or improved electricity service - Female (CRI, Number)		0.00	0.00	101,000.00	211,000.00	464,000.00



Intermediate Results Indicator by Results Areas

Indicator Name	DLI	Baseline	Intermediate Targets				End Target
			1	2	3	4	
Improved financial performance of electricity sector							
ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL (Text)		Lack of systematic issuance of resolution setting MAR of SONATREL for the following year	Lack of systematic issuance of resolution setting MAR of SONATREL for the following year	ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL for following year	ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL for following year	ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL for following year	ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL for following year
Annual compensation amount estimated and included into National Budget Law (Text)		Non-regular inclusion of compensation amount in Annual Budget Law	ARSEL has issued a resolution establishing a procedure to estimate the tariff deficit to be included in the National Budget Law and has timely reported to MINFI the resulting value for 2024.	ARSEL has communicated timely to MINFI the estimated value of compensation for 2025 to be included in National Budget Law.	ARSEL has communicated timely to MINFI the estimated value of compensation for 2026 to be included in National Budget Law.	ARSEL has communicated timely to MINFI the estimated value of compensation for 2027 to be included in National Budget Law.	ARSEL has communicated timely to MINFI the estimated value of compensation for 2028 to be included in National Budget Law.
Smart meters installed and put in service to record consumption of public facilities (Number)		0.00	0.00	3,750.00	7,500.00	11,250.00	15,000.00
Public lamps with metered consumption (Number)		0.00	0.00	37,500.00	75,000.00	112,500.00	150,000.00
Strengthened operational performance, enhanced accountability and transparency of electricity sector							
Women interns in technical internships (Percentage)		15.00	15.00	15.00	20.00	25.00	30.00
Women accessing energy sector jobs/promotion following internship		5.00	5.00	5.00	10.00	15.00	20.00



Indicator Name	DLI	Baseline	Intermediate Targets				End Target
			1	2	3	4	
(Percentage)							
Grievances registered and addressed within the GRM timeframe (Percentage)		0.00	0.00	50.00	50.00	100.00	100.00
Increased access to electricity							
Households provided with new electricity service (Number)	DLI 5	0.00	0.00	0.00	46,000.00	96,000.00	211,000.00
Increase in renewable electricity supply to grid-connected and mini-grid consumers (Gigawatt-hour (GWh))	DLI 6	0.00	0.00	7.00	14.90	29.70	44.60
Increase in transformation capacity in transmission system (Kilovolt-Amphere(KVA))	DLI 7	2,898,000.00	2,898,000.00	2,898,000.00	2,898,000.00	3,000,000.00	3,136,900.00
Net greenhouse gas (GHG) emissions (CRI, Metric tons/year)		0.00	0.00	168,000.00	168,000.00	168,000.00	168,000.00

**Monitoring & Evaluation Plan: PDO Indicators**

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Reduction of annual revenue gap between maximum allowed revenues and tariff revenues	Annual reduction in tariff shortfall in electricity sector	Annual	MINEE reports to be verified by IVA	Monitoring reports	MINEE
Timely payments of public administration's electricity consumption and annual compensation	Timely payments of Central government electricity consumption and compensation	Annual	MINEE reports to be verified by IVA	MINEE	MINEE
Public disclosure of annual audits of ENEO and SONATREL performance reports	Public disclosure of annual audits of ENEO and SONATREL performance reports	Annual	Annual reports and website	Annual reports	PIU, ENEO, SONATREL
People provided with new or improved electricity service					
People provided with new or improved electricity service - Female					

**Monitoring & Evaluation Plan: Intermediate Results Indicators**

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL	ARSEL has issued an annual resolution setting MAR of ENEO and SONATREL for following year	Annual	Resolutions issued by ARSEL on final values	Annual Reports	PIU
Annual compensation amount estimated and included into National Budget Law	Annual compensation amount estimated and included into National Budget Law	Annual	MINFI	Annual reports	PIU
Smart meters installed and put in service to record consumption of public facilities	Smart meters installed and put in service at points of electricity supply to public facilities as per Billing Improvement Plan	Annual	MINEE	MINEE reports	MINEE
Public lamps with metered consumption	Public lamps with metered consumption	Annual	MINEE	MINEE reports	MINEE
Women interns in technical internships	Percentage of women interns in technical	Annual	MINEE	MINEE reports	MINEE
Women accessing energy sector jobs/promotion following internship	Percentage of women accessing energy sector jobs/promotion following internship	Annual	MINEE	MINEE reports	MINEE
Grievances registered and addressed within the GRM timeframe	Percentage of project-related grievances registered and addressed within the GRM timeframe	Annual	Annual Report	ENEO reports	ENEO
Households provided with new electricity service	Households provided with new or improved electricity service	Annual	ENEO	Annual reports	PIU, ENEO



Increase in renewable electricity supply to grid-connected and mini-grid consumers	Energy generated by solar photovoltaic plants commissioned after January 1, 2024 and supplied to grid-connected and mini-grid consumers.	Annual	MINEE	Annual reports	PIU, MINEE
Increase in transformation capacity in transmission system	Total installed transformation capacity in transmission system increase.	Annual	SONATREL	Annual reports	PIU, SONATREL
Net greenhouse gas (GHG) emissions	Project net greenhouse gas (GHG) emissions are calculated as an annual average of the difference between project gross (absolute) emissions aggregated over the economic lifetime of the project and the emissions of a baseline (counterfactual) scenario aggregated over the same time horizon. They are reported in metric tons of carbon dioxide equivalent per year.	Annual	MINEE	Annual reports	PIU, MINEE



ANNEX 2. DISBURSEMENT LINKED INDICATORS, DISBURSEMENT ARRANGEMENTS AND VERIFICATION PROTOCOLS



Disbursement Linked Indicators Matrix

DLI 1	Reduction of annual revenue gap (RG) between maximum allowed revenues (MAR) and tariff revenues (TR), expressed as a percentage of MAR.			
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Outcome	No	Percentage	40,000,000.00	14.30
Period	Value		Allocated Amount (USD)	Formula
Baseline	9.50			
Prior Results			0.00	NA
31 December 2024	9.50		0.00	NA
31 December 2025	7.00		14,000,000.00	(allocation of EUR 13.118 million) proceeds will be disbursed once target is reached
31 December 2026	6.00		16,000,000.00	(allocation of EUR 14.992 million) proceeds will be disbursed once target is reached
31 December 2027	5.00		10,000,000.00	(allocation of EUR 9.37 million) proceeds will be disbursed once target is reached



DLI 2	Timely payments of public administration’s electricity consumption and annual compensation by Ministry of Finance to ENEO, as per applicable regulatory framework			
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Outcome	No	Text	40,000,000.00	14.30
Period	Value		Allocated Amount (USD)	Formula
Baseline	Irregular payments of annual compensation and electricity bills of public facilities			
Prior Results			0.00	NA
31 December 2024	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2024 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each quarter; (b) (i) 70% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2024, and (ii) 100% of the budgeted amount for central government’s electricity bills estimated by ARSEL for year 2024 have been paid by the end of the first quarter of 2025.		10,000,000.00	EUR 4.685 million and EUR 4.685 million for target (a) and (b) respectively
31 December 2025	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2025 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each quarter; (b) (i) 80% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2025, and (ii) 100% of the budgeted amount		10,000,000.00	EUR 4.685 million and EUR 4.685 million for target (a) and (b) respectively



	for central government's electricity bills estimated by ARSEL for year 2025 have been paid by the end of the first quarter of 2026.		
31 December 2026	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2026 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each quarter; (b) (i) 90% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2026, and (ii) 100% of the budgeted amount for central government's electricity bills estimated by ARSEL for year 2026 have been paid by the end of the first quarter of 2027.	14,000,000.00	EUR 6.559 million and EUR 6.559 million for target (a) and (b) respectively
31 December 2027	(a) 100% of the budgeted amount of tariff compensation as estimated by ARSEL for calendar year 2027 has been paid by MINFI in quarterly disbursements made no later than three months after the end of each quarter; (b) (i) 100% of the budgeted amount for public lighting bills estimated by ARSEL for calendar year 2027, and (ii) 100% of the budgeted amount for central government's electricity bills estimated by ARSEL for year 2027 have been paid by the end of the first quarter of 2028.	6,000,000.00	EUR 2.811 million and EUR 2.811 million for target (a) and (b) respectively



DLI 3				
Public facilities with functioning smart meters and public lighting with functioning meters				
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Output	Yes	Text	40,000,000.00	14.30
Period	Value		Allocated Amount (USD)	Formula
Baseline	N/A			
Prior Results			0.00	
31 December 2024	(a) Smart meters are installed and put in service at points of electricity supply to public facilities as per Billing Improvement Plan; (b) Smart meters are installed and put in service to record consumption of public lighting lamps.		0.00	see formula in the verification procedure
31 December 2025	(a) Smart meters are installed and put in service at points of electricity supply to public facilities as per Billing Improvement Plan; (b) Smart meters are installed and put in service to record consumption of public lighting lamps.		0.00	see formula in the verification procedure
31 December 2026	(a) Smart meters are installed and put in service at points of electricity supply to public facilities as per Billing Improvement Plan; (b) Smart meters are installed and put in service to record consumption of public lighting lamps.		0.00	see formula in the verification procedure
31 December 2027	(a) Smart meters are installed and put in service at points of electricity supply to public facilities as per Billing Improvement Plan; (b) Smart meters are installed and put in service to record		40,000,000.00	(total allocation of EUR 37.48 million) see formula in the verification procedure



	consumption of public lighting lamps.			
DLI 4	Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually			
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Output	No	Text	7,000,000.00	2.50
Period	Value		Allocated Amount (USD)	Formula
Baseline	Absence of systematic regulatory audit of the performance of ENEO and SONATREL			
Prior Results			0.00	
31 December 2024	(a) ARSEL has published a report on technical audit of performance of ENEO for calendar year 2023. (b) ARSEL has published a report on technical audit of performance of SONATREL for calendar year 2023.		2,000,000.00	EUR 937,000.00 and EUR 937,000.00 for target (a) and (b) respectively.
31 December 2025	(a) ARSEL has published a report on technical audit of performance of ENEO for calendar year 2024. (b) ARSEL has published a report on technical audit of performance of SONATREL for calendar year 2024.		2,000,000.00	EUR 937,000.00 and EUR 937,000.00 for target (a) and (b) respectively.
31 December 2026	(a) ARSEL has published a report on technical audit of performance of ENEO for calendar year 2025. (b) ARSEL has published a report on technical audit of performance of SONATREL for calendar year 2025.		2,000,000.00	EUR 937,000.00 and EUR 937,000.00 for target (a) and (b) respectively.
31 December 2027	(a) ARSEL has published a report on technical audit of performance of ENEO for calendar year		1,000,000.00	EUR 468,500.00 and EUR 468,500.00



	2026. (b) ARSEL has published a report on technical audit of performance of SONATREL for calendar year 2026.			for target (a) and (b) respectively.
DLI 5	Households provided with new electricity service			
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Outcome	Yes	Text	53,000,000.00	18.90
Period	Value		Allocated Amount (USD)	Formula
Baseline	0.00			
Prior Results	NA		0.00	NA
31 December 2024	(a) National Electrification Master Plan (NEMP) approved and disclosed by MINEE. (b) Ministerial resolution defining the process to be adopted for the systematic update of the Generation, Transmission and Distribution Master Plan approved and disclosed by MINEE.		20,000,000.00	(a) EUR 14,055,000.00 and (b) EUR 4,685,000.00 respectively.
31 December 2025	New households are connected through grid densification, and become electricity consumers		0.00	EUR 146.547 per new household connected.
31 December 2026	New households are connected through grid densification, and become electricity consumers		0.00	EUR 146.547 per new household connected.
31 December 2027	New households are connected through grid densification, and become electricity consumers		33,000,000.00	EUR 146.547 per new household connected.



DLI 6				
Increase in renewable electricity supply to grid-connected and off-grid consumers				
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Outcome	Yes	Text	34,000,000.00	12.10
Period	Value		Allocated Amount (USD)	Formula
Baseline	0.00			
Prior Results	0.00		0.00	NA
31 December 2024	Generation, Transmission and Distribution Master Plan approved by MINEE.		14,000,000.00	(Allocation of EUR 13.118 million) upon verification.
31 December 2025	Energy generated by solar photovoltaic plants commissioned after January 1, 2024, is supplied to grid-connected and mini-grid consumers.		0.00	Scalable. EUR 419,616 /GWh of energy generated by solar PV plants
31 December 2026	Energy generated by solar photovoltaic plants commissioned after January 1, 2024, is supplied to grid-connected and mini-grid consumers.		0.00	Scalable. EUR 419,616 /GWh of energy generated by solar PV plants
31 December 2027	Energy generated by solar photovoltaic plants commissioned after January 1, 2024, is supplied to grid-connected and mini-grid consumers.		20,000,000.00	Scalable. EUR 419,616 /GWh of energy generated by solar PV plants
DLI 7				
Increase in available transformation capacity in transmission substations operated by SONATREL				
Type of DLI	Scalability	Unit of Measure	Total Allocated Amount (USD)	As % of Total Financing Amount
Outcome	Yes	Text	66,000,000.00	23.60
Period	Value		Allocated Amount (USD)	Formula



Baseline	2,898 MVA		
Prior Results	NA		0.00
31 December 2024	ARSEL has reviewed and approved SONATREL's investment plan 2024-2028, including tools to improve SONATREL's performance.	10,000,000.00	(Allocation of EUR 9.37 million) upon verification
31 December 2025	Updated Performance Contract incorporating investment plan approved by ARSEL has been signed by the Recipient and SONATREL.	6,000,000.00	(Allocation of EUR 5.622 million) upon verification
31 December 2026	Increase in the total available transformation capacity in transmission substations operated by SONATREL (target 3,136.9 MVA)	0.00	upon verification EUR 14,935per MVA of transformation capacity added.
31 December 2027	Increase in the total available transformation capacity in transmission substations operated by SONATREL (target 3,136.9 MVA)	50,000,000.00	upon verification EUR 14,935per MVA of transformation capacity added.

Verification Protocol Table: Disbursement Linked Indicators

DLI 1	Reduction of annual revenue gap (RG) between maximum allowed revenues (MAR) and tariff revenues (TR), expressed as a percentage of MAR.
Description	MAR= maximum allowed revenues of the sector to carry out operations, determined every year by ARSEL. TR = annual tariff revenues of ENEO resulting from sales to customers at applicable tariff rates for the year, determined by ARSEL. C= annual value of compensation = MAR-TR, determined by ARSEL In the first half of each year, the regulator ARSEL will issue a resolution setting the final value of MAR and C for the previous year, based on ex-post values of sales, costs in each segment of the value chain.
Data source/ Agency	ARSEL
Verification Entity	IVA



Procedure	Starting in 2025, IVA verifies resolutions issued by ARSEL on final values (determinations) of MAR and C for the previous year. The IVA calculates the RG as per the agreed formula $RG = 100 \times (C/MAR)$.
DLI 2	Timely payments of public administration’s electricity consumption and annual compensation by Ministry of Finance to ENEO, as per applicable regulatory framework
Description	The purpose of this DLI is to improve the financial performance of the sector by enabling regular payments to ENEO of fully accurate and auditable bills for electricity consumption of facilities of Central Government and public lighting, as well as of annual amounts of compensation to cover tariff shortfalls.
Data source/ Agency	MINFI
Verification Entity	IVA
Procedure	IVA verifies whether: (i) the amount of compensation included in the annual finance law has been paid by MINFI to ENEO in quarterly disbursements made not later than 3 months after the end of each quarter, (ii) 70% of public lighting bills of year 2024 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2025; 80% of public lighting bills of year 2025 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2026; 90% of public lighting bills of year 2026 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2027; 100% of public lighting bills of year 2027 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2028; and (ii) budgeted amounts for electricity consumption of central government buildings estimated by ARSEL have been paid in full within the first quarter of the following year. The IVA reviews documents provided by MINFI and ARSEL to certify budgeted amounts and payments made.
DLI 3	Public facilities with functioning smart meters and public lighting with functioning meters
Description	This DLI incentivizes timely payments for electricity consumption and public lighting. The preparation and execution of a Billing Improvement Plan (BIP) to install smart meters will be led by MINEE. It will allow ENEO to issue accurate bills for actual consumption, and GoC to assess on its own accuracy of those bills by monitoring consumption remotely. As regards public lighting, the installation of smart meters will replace current billing based on consumption estimates, which are inherently inaccurate. Besides, GoC will have the option to activate the pre-paid function in the installed smart meters in some of its facilities, as needed.
Data source/ Agency	MINEE
Verification Entity	IVA
Procedure	This DLI aims to improve accuracy of billing and enable payment of the Central Government’s agencies and public lighting electricity consumption.



	MINEE will prepare and implement a ‘Billing Improvement Plan (BIP)’ consisting of (a) the installation of smart meters and advance metering infrastructure in all public facilities of the Central Government (around 15,000) and (b) the implementation of a public lighting consumption metering plan targeting 150,000 lamps. The implementation of the BIP will allow ENEO to issue accurate bills for actual consumption, and GoC to assess on its own accuracy of those bills by monitoring consumption remotely. Besides, GoC will have the option to activate the pre-paid function in the installed smart meters in some of its facilities, as needed.
DLI 4	Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually
Description	The purpose of this DLI is to track systematic compliance by ARSEL with its core regulatory duty to monitor the performance of ENEO as prescribed in the concession contract, and, if needed, adopt corrective action as per contract provisions to enforce achievement of KPIs on performance (losses, new connections, quality of service, etc.) agreed for the extension of the concession contract until 2031. The DLI also aims to strengthen ARSEL’s monitoring capacity of SONATREL’s performance as per its concession contract with the Government of Cameroon.
Data source/ Agency	ARSEL
Verification Entity	IVA
Procedure	<p>ARSEL will conduct annual regulatory audits on ENEO’s and SONATREL’s performance, including the identification of eventual deviations from expected performance and recommendations on how to address/correct them. In each annual audit, it will be verified what was done to address recommendations from previous ones, and future determinations of MAR by ARSEL may be adjusted accordingly.</p> <p>The IVA verifies that: (i) ENEO’s and SONATREL’s performance audit of the previous year are disclosed on ARSEL’s website during the first quarter of the next year with the timestamp of disclosure, (ii) disclosed performance audit report identifies eventual deviations from KPIs in the concession contract of ENEO and SONATREL, and recommendations on how to correct them, and (iii) disclosed performance audit describes actions undertaken to address recommendations in the performance audit of the previous year.</p>
DLI 5	Households provided with new electricity service
Description	The purpose of this DLI is to track improvements in the quality of electricity service provided to existing consumers and connection of new users through grid densification (construction of 15 kV and lower voltage networks and service connections) to increase overall electrification rate and foster systematic least-cost generation and transmission and electrification planning (as key enablers of sector sustainable development), through the approval of a National



	Electrification Master Plan (NEMP) and of the process to be adopted for the systematic update of the Generation, Transmission and Distribution Master Plan.
Data source/ Agency	MINEE
Verification Entity	IVA
Procedure	<p>MINEE provides:</p> <ol style="list-style-type: none"> 1. In December 2024, December 2025, and December 2026: digital documents clearly describing geographic areas where connections of new households and other structures will be executed in the following year under PforR. 2. Report on execution of each semester, including coordinates in the geographic information system (GIS) supported database of each point where a new electricity connection was built and put in service; and a digital photo of the meter installed at each new connection (linked to GIS coordinates of the point of supply), clearly identifying number and other characteristics. <p>Total disbursements under DLR5.2 to DLR5.4 are capped at EUR 30,921,000.00 (target 211,000 connections).</p>
DLI 6	Increase in renewable electricity supply to grid-connected and off-grid consumers
Description	This DLI tracks progress in increasing the share of renewable energy in the electricity generation mix, by hybridizing existing thermal plants in systems where this is the main primary resource with solar PV to reduce heavily subsidized fuel consumption and lower related greenhouse gases emissions and operating costs. This action is part of the least cost generation and transmission expansion plan, which calls for a significant reduction in use of imported oil products for thermal generation, replacing them by generation based on renewable resources to the largest extent compatible with security of supply criteria. 44.66 GWh of solar PV power generation is expected to be supplied in the 2025-2027 period through the hybridization of isolated systems currently running on diesel thermal generation with public and/or private financing.
Data source/ Agency	MINEE
Verification Entity	IVA
Procedure	<p>MINEE provides:</p> <ol style="list-style-type: none"> 1. In January 2024: list of solar PV generation plants expected to be installed under PforR, including technical characteristics (installed capacity, type of equipment) and coordinates of each facility in a GIS database. 2. Report on execution of each semester, describing each and all solar PV generation plants used for public electricity service delivery installed under the PforR in the country, including: technical characteristics (installed capacity, type of



	<p>equipment, manufacturer); coordinates of each facility in a GIS database; dated digital photos of smart meters recording energy sent out and consumption of plant auxiliaries corresponding to the date of commissioning (initial connection to the supplied system). MINEE will also inform IVA at least 15 days in advance of commissioning date of each plant to allow him to witness the event and collect records of meters.</p> <p>IVA: (i) carries out physical inspection of new solar PV generation facilities and checks data loggers to record amounts of energy generated and verify that total annual generation from additional solar PV systems commissioned after the Program approval date is equal or above targets, and (iii) verifies that MINEE has issued and disclosed a resolution adopting an updated Generation, Transmission and Distribution Master Plan.</p> <p>Total disbursements under DLR 6.2 to 6.4 capped at EUR 18,740,000.00 (target of 44.66 GWh).</p>
DLI 7	Increase in available transformation capacity in transmission substations operated by SONATREL
Description	The purpose of this DLI is to achieve the elimination of bottlenecks and other issues in the existing transmission infrastructure operated by SONATREL created by several years of systematic underinvestment in the segment, which affect the quality and reliability of transmission services, and limit the electricity consumption of large users and demand growth in general, despite sufficient generation capacity is available.
Data source/ Agency	SONATREL
Verification Entity	IVA
Procedure	<p>MINEE reports:</p> <ol style="list-style-type: none"> 1. In December 2023: inventory of existing transformers in each and all transmission substations operated by SONATREL in the country, including technical characteristics (installed capacity, type of equipment, manufacturer). 2. Report on execution of each semester containing updated inventory, with clear identification of: transformers added in, and transformers removed from each substation, including technical characteristics (installed capacity, type of equipment, manufacturer) and a digital photo of each equipment. <p>IVA: (i) carries out physical inspections to SONATREL’s substations to assess accuracy of values in reports of each semester on transformation capacity added, (ii) verifies that ARSEL has issued a resolution approving SONATREL’s investment plan 2024-2028, including tools to improve SONATREL’s performance, and (iii) verifies that GoC and SONATREL’s Board have signed and updated a Performance contract incorporating the investment plan approved by ARSEL.</p> <p>DLR 7.3 - DLR 7.4 amount is capped at EUR 46,850,000.00 (target of 3,136.9 MVA).</p>



ANNEX 3. TECHNICAL ASSESSMENT

Rationale for the Design of PforR to Support the GoC's CESRP

1. The CESRP prepared by the GoC includes a set of consistent and coordinated actions identified, defined, and prioritized starting from a detailed assessment of the situation of Cameroon's power sector articulated around three key pillars that are critical for the sustainable development of the power sector in any emerging country (with electricity demand growing at medium/high rates):

- (a) **Financial viability of the sector**, through tariff revenues collected from electricity consumers, eventually complemented with other funds (grants and soft loans from development partners and so on) allowing for the recovery of costs incurred for efficient service delivery in all segments of the value chain. Tariff rates reflecting those costs (fixed, demand related, and energy related) should be applied to consumers in all categories who are able to pay them and must be complemented by a subsidization scheme protecting low-income/vulnerable users through a 'social tariff' defined based on their affordability.
- (b) **Efficient, transparent, and accountable operational performance of the companies in all segments of the value chain**, with a strong focus on the distribution and retail utilities providing electricity service to final consumers (the 'foundations' of the power sector building).
- (c) **Systematic planning of least-cost investments in all segments of the electricity supply chain** (including those for electrification, if the country has not achieved universal access) needed to meet demand and timely implementation of those investments at least-cost for the country through competitive processes.

2. Based on the outcomes of the assessment on the three key pillars, the CESRP encompasses seven priority areas: (a) a greener electricity generation mix; (b) a resilient transmission grid; (c) a financially sustainable sector; (d) a well-performing operator; (e) an increased access to electricity; (f) an expanded industrial load; and (g) a skilled local workforce.

3. Specifically, the Government intends to improve financial performance (priority area (c)) by adjusting tariffs to certain consumer categories, reduce tariff subsidies ('compensation'), and improve public sector payment of electricity consumption. To improve the operational performance of sector operators (priority area (d)), the Government will strengthen the regulatory oversight and monitoring of investments, particularly from ENEO. Government will increase access to electricity (priority area (e)) by extending the LV/MV grid to bridge the large urban-rural access gap with the financial support of the FDSE and several donor-funded projects, including the World Bank. Increase in electricity demand from industrial customers (priority area (f)) will be promoted by implementing a set of measures to incentivize industries currently relying on expensive self-generation to connect to the national electricity grid.

4. In line with the fundamental requirements for power sector development articulated in the CESRP and actions in each of its priority areas, the PforR proposes to support the implementation of the plan through the following RAs to achieve the PDO results. The RAs are reflected in the respective DLIs and DLRs.

- (a) **RA 1:** Improved financial performance of the electricity sector;



- (b) **RA 2:** Strengthened operational performance, enhanced accountability and transparency of the electricity sector;
- (c) **RA 3:** Increased access to electricity.

5. Some investments are needed to implement the policy and reform actions in each component. They include metering of electricity consumption of government agency buildings and public lighting installations; replacement of public lighting luminaires with high-efficiency devices; rehabilitation, improvement, and reinforcement of electric power transmission substations of the network operated by SONATREL; rehabilitation, upgrade, and expansion of distribution networks to improve quality of service and increase access rate; and installation of PV solar generating plants to reduce fuel consumption in thermal power plants used to meet demand (mainly in RIN). These investments are reflected as Sub-DLIs and DLRs of the DLIs of the Program.

6. **Through the various actions in the results matrix, the PforR will support the sector in preparing for the significant expansion in generation capacity that will occur with the full commissioning of Nachtigal in 2024**, as additional generation (representing approximately 30 percent of total national capacity) will be available to be injected into the network. Through tariff adjustments in the MV and HV categories and improvement in payment discipline by the GoC supported under the PforR, the payment capacity of ENEO under the PPA with the NHPC would improve. Transmission and distribution investments to remove bottlenecks in the existing networks would improve the capacity of the system to meet the additional demand in the residential and industrial customer segments. This would have the ripple effect of increasing the customer base and sector sales and revenues, which would enhance financial viability of the sector. These proposed actions under the PforR are conditions sine qua non for the financial sustainability of the sector and are independent from the future ownership structure of the generation and distribution segments.

RA 1: Improved financial performance of the electricity sector

7. **DLI 1: Reduction of annual revenue gap between maximum allowed revenues and tariff revenues, expressed as a percentage of MAR.** This DLI tracks commitment of the GoC to progressively reduce tariff shortfalls to move the sector into a situation of financial sustainability. This implies implementing a systematic gradual reduction of the subsidies provided by the GoC through annual ‘compensation’. The annual amount of compensation is largely dependent on the evolution of key factors affecting costs of electricity service delivery (hydrology and imported fuel prices) and shows high volatility as can be observed from previous years: as it has happened in past few years.

Table 3.1. Annual Tariff Compensation to the Energy Sector by the GoC

	2016	2017	2018	2019	2020	2021	2022	2023 ^a
XAF, billions	11.0	6.9	-12.7	45.3	3.8	54.4	75.4	29.4
US\$, millions	17.8	11.2	-20.4	73.2	6.1	87.9	121.9	47.5

Note: a. 2023 figures are forecasted.

8. **While MARs of the sector are determined annually by ARSEL based on evolution of costs of service delivery, tariff revenues do not follow the same pattern, as tariff rates for all categories remained unchanged from 2012 to end of 2022.** This created almost permanent tariff shortfalls and the need for Government’s subsidies through ‘compensation’. In December 2022, ARSEL took an initial step



to reduce tariff shortfalls by increasing electricity tariffs applied to MV consumers and revising upward the floor price for sales by ENEO to HV customers. This ended a 10-year period without tariff adjustments.

9. **Moving forward, the incorporation of energy generated by Nachtigal hydropower plant from 2024 will create, in the medium term, a more stable scenario, as its relatively high load factor will imply a significant reduction in fuel consumption, lowering average generation cost and cost-reflective tariff level in a context of growing demand.** This is likely to lead to a financially self-sufficient sector (no need for compensation) some three to four years after the plant can inject all its production into the transmission system. However, as is often the case with the commissioning of large capital-intensive power plants, the initial period of operation of Nachtigal will possibly create some short-term financial hurdles; while ‘take or pay’ obligations by ENEO will become mandatory as soon as the plant is commissioned, sales to consumers will not increase at the same pace. Delays in the commissioning of transmission infrastructure needed to connect the plant to the RIS will exacerbate this effect.

10. In this context, the GoC will commit to a gradual reduction of compensation as a percentage of MAR for the period of the PforR, assuming that forecasted values of key parameters of MAR considered for estimation of compensation match reality. Specifically, these parameters are (a) annual hydropower generation in each system (GWh); (b) oil derivative prices; and (c) amounts of energy generated by Nachtigal injected to the transmission system. Given the high uncertainty of the value of MAR and related compensation for 2024 created by the commissioning of the Nachtigal hydropower plant and transmission facilities required to inject its energy into the transmission system, it is proposed that the initial point on the trajectory of compensation as a declining percentage of MAR be 2025, with annual targets set for the last three years of the operation.

11. **Verification protocol.** ARSEL will annually set the revenue requirement of the sector to carry out operations with efficiency levels prescribed in the regulation, by determining the overall sector MAR consisting of allowed revenues for ENEO, SONATREL, and EDC to cover their respective costs of service delivery with the levels of efficiency defined by the applicable regulation. This is included in the PAP (Annex 6). The revenue requirement will be obtained through a combination of tariff revenues collected by ENEO and ‘compensation’ provided by Government, with a declining share of the latter as a percentage of the total. To accurately measure the GoC’s commitment to gradually reduce the amount of tariff compensation over time, a tolerance band (+/-5 percent) on values of the following parameters considered in the annual estimation of compensation will be taken into account: (a) annual hydropower generation in each system (GWh); (b) oil derivative prices; and (c) amounts of energy generated by Nachtigal injected into the transmission system. Every year from 2025, ex ante estimation and ex post verification of values of compensation carried out by ARSEL as well as actual values of key parameters of MAR will be reviewed by an IVA to assess compliance with this DLI.

12. **DLI 2: Timely payments by Ministry of Finance to ENEO of amounts due for electricity consumption of public administration agencies and public lighting, and of annual compensation, as per applicable regulatory framework.** This DLI refers to regular payment by the GoC of electricity consumption of its agencies and of public lighting, as well as of the compensation to cover the gap between allowed electricity sector costs (determined by ARSEL through MAR of regulated companies) and tariff revenues. Both items have decisive impacts on the financial sustainability of the sector. On the one hand, billing of government agencies (including state-owned companies ALUCAM and CAMWATER consuming large amounts of energy) represents around 15–20 percent of ENEO’s annual turnover. On the



other hand, although variable from year to year, the amounts of compensation can also be significant when hydrology is poor and/or fuel prices in international markets are high, as Cameroon imports all oil products used for thermal generation. Achieving timely payment of electricity bills from government agencies requires putting in place some enabling conditions. The most important one is annual estimations by ARSEL of amounts of those items (compensation, electricity bills of government agencies and public lighting) to be included in the annual finance law.

13. **Verification protocol.** The IVA verifies whether: (a) the amount of compensation included in the annual finance law has been paid by MINFI to ENEO in quarterly disbursements made not later than three months after the end of each quarter; (b) 70 percent of public lighting bills of year 2024 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2025; 80 percent of public lighting bills of year 2025 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2025; 90 percent of public lighting bills of year 2026 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2027; 100 percent of public lighting bills of year 2027 estimated by ARSEL have been paid by MINFI to ENEO by Q1 2028; and (c) budgeted amounts for electricity consumption of central government buildings estimated by ARSEL have been paid in full within the first quarter of the following year. The IVA reviews documents provided by MINFI and ARSEL to certify budgeted amounts and payments made.

14. **DLI 3: Public facilities and public lighting with functioning smart meters.** The GoC's high-level officials have expressed concerns about the accuracy of bills currently issued by ENEO for those consumption points and the need to achieve a situation characterized by full transparency and accuracy in those transactions. For that, the CESRP includes the implementation of a 'Billing Improvement Plan' comprising the installation of advanced metering infrastructure at all points of electricity consumption of public facilities (around 15,000), which will allow remote, independent access to records of the meters by utility and consumers to assess accuracy of billing. Once full accuracy and reliability have been reached in billing of these consumptions, MINFI will systematically apply the approved procedure for regular payment to ENEO of the amounts of these sales as prescribed in applicable regulatory framework.

15. Recording consumption of public lighting for billing purposes also requires substantive improvements. Networks for public lighting (cables and conductors, poles, luminaries, and so on) are not included in the scope of ENEO's concession contract, and the only obligation of the utility is to supply electricity to them. However, at present, most of the points of supply are unmetered. As part of the 'Billing Improvement Plan', the CESRP includes the definition and implementation of a public lighting consumption metering plan. A detailed technical assessment is needed to define the scope and implementation arrangements of the optimum plan, which will target metering electricity consumption of around 150,000 lamps in the public lighting system.

16. **Verification protocol.** MINEE will share: (a) documents describing universe of points of electricity supply to: (i) public buildings; and (ii) public lighting as of January 1, 2024, including coordinates of each point in a GIS supported database and dated digital photos of each point (dated newspaper or equivalent document included in the photo); and (b) report on execution of each semester, including: (i) coordinates in the GIS supported database of the initial document of each point of electricity supply to public facilities where a smart meter was installed, together with a digital photo of the metering premises of the point of supply where the smart meter was installed; and (ii) coordinates in the GIS supported database of the initial document of each point of electricity supply to public lighting where a smart meter and high efficiency lamps were installed, together with a digital photo of the metering premises of the point of



supply where the smart meter was installed. IVA carries out physical inspections of public buildings and public lighting facilities reported with new meters by sampling, with representative samples defined as per national or ISO applicable standards.

RA 2: Strengthened operational performance, enhanced accountability and transparency of the electricity sector

17. **DLI 4: Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually.** This DLI and associated DLRs reflect the actions in the scope of the component of the Program intended to improve transparency in the sector by strengthening the effectiveness of ARSEL in its key role of permanent monitoring of operational performance of ENEO and SONATREL, through the systematic execution of technical audits.

18. In the case of ENEO, technical audits are prescribed in the concession contract. The third amendment ('Avenant No. 3') to the contract sets the regulatory conditions of ENEO's concession contract for 2021–2026, including KPIs on losses, new service connections, improvements in quality of service provided to customers, and so on. As prescribed in the concession contract, ARSEL must monitor performance of the utility and assess strict compliance with its obligations defined in Amendment 3, such as agreed values of KPIs, as well as the delivery of electricity and customer service according to applicable standards on quality and continuity, execution of approved investments, and so on. Depending on the severity of noncompliance with agreed values of KPIs and other contract provisions, corrective actions may vary from application of penalties (capped at 3 percent of annual turnover of ENEO) to early termination of the concession contract and replacement of ENEO's management.

19. Regulatory audits of performance of ENEO and SONATREL will be key tools to allow ARSEL to comply with its core regulatory duty and ensure sustainability. They will include identification of eventual deviations from expected performance and recommendations on how to address/correct them. In each annual audit, what was done to address recommendations from previous ones will be verified, and future determinations of MAR by ARSEL may be adjusted accordingly.

20. **Verification protocol.** The IVA verifies that: (a) ENEO's and SONATREL's performance audit of the previous year is disclosed on ARSEL's website during the first quarter of the next year with the timestamp of disclosure; (b) disclosed performance audit report identifies eventual deviations from KPIs in the concession contract of ENEO and expected performance of SONATREL, and recommendations on how to correct them; and (c) disclosed performance audit describes actions undertaken to address recommendations in the performance audit of the previous year.

RA 3: Increased access to electricity

21. **DLI 5. Households provided with new electricity service.** This DLI tackles improvements in the quality of electricity service provided to existing consumers, as well as connection of new users to increase overall electrification rate and the adoption of actions to systematize least-cost generation and transmission and electrification planning.

22. Comprehensive international experience in emerging countries worldwide shows that systematic least-cost generation and transmission and electrification planning are key to achieve sector sustainable



development, including universal access to electricity service. In the 1990s and first half of the current century, several countries in Latin America and other regions carried out comprehensive reforms in the power sector. In all cases, the main driver of the reform was a deep operational and financial crisis in the electricity sector. State-owned companies were restructured and privatized or capitalized, generation prices were deregulated, and wholesale electricity markets were created to promote competition amongst stakeholders, as well as independent institutions responsible for sector regulation and monitoring and market administration. This first market-oriented reform was in general successful in improving the performance of the electricity companies regarding the quality of services provided to existing consumers. However, due to the lack of right long-term signals to investors needed to enable expansion of generation installed capacity to meet increasing demand, most of the countries with significant share of hydropower in the generation mix (Brazil, Chile, and Colombia) faced situations of energy rationing during dry periods. Security in energy supply then emerged as a relevant issue, and its importance is likely to increase in countries where the electricity demand is expected to grow at significant rates over the next decades, and hydropower represents a high share of the electricity generation mix such as Cameroon.

23. Addressing adequacy of electricity supply as an objective of high priority for a country requires direct involvement of the Government in planning the expansion of the power sector. This does not imply that the Government becomes directly involved in the construction and operation of facilities needed to expand the sector but must adopt arrangements to ensure that the benefits of private sector efficiency are transferred to consumers by the distribution companies through competitively awarded long-term PPAs secured between those companies and successful bidders. Additionally, moving forward, the electrification agenda requires the definition and application of an EMP addressing institutional, technical, financial and environmental and social aspects related to the matter. Therefore, this DLI includes results requiring that MINEE publish resolutions approving the EMP, define the process to be adopted for the systematic update of the Generation and Transmission Master Plan.

24. MINEE's PIU, with the support of an owner's engineer, is expected to connect to electricity service around 211,000 currently unserved households, which will benefit over one million people. Works to be executed for that purpose are usually identified as "grid densification", and include the construction of the following distribution networks components in urban and peri-urban areas currently having medium voltage (15 kV) infrastructure: extension of 15 kV overhead lines, installation of pole mounted medium to low voltage (15 to 0.4 KV) distribution transformers of different capacities (15 to 400 kVA), extension of low voltage (0.4 kV) overhead lines, construction of low voltage service drops to connect low voltage lines with households and other buildings.

25. Construction of 15 kV and low voltage lines is in general made at the side of public roads and streets, without requirements on rights of way. It's quite usual to use same poles for both lines and to mount medium to low voltage distribution transformers. If small capacity distribution transformers supplying few customers are used (US network topology), LV networks are short and it's economic to build them using twisted cable, which is very resistant to weather events and external aggressions in general, while also creating a less risky condition if it falls to the ground. Grid densification could also include construction of a few 15 kV service drops to connect at this MV level buildings of factories and other facilities with high electricity demand (1-3 MW), which makes supply in LV technically unfeasible. As several appliances of those facilities (motors and others) operate at LV, those new consumers supplied at



MV must build inside their premises at their cost a MV/LV substation they will own, like any other equipment used for their productive processes.

26. **Verification protocol.** MINEE shares the annual reports on new connections built. The IVA verifies that: (a) the number of new connections reported by MINEE's PIU in its annual reports is correct by carrying out physical inspections through sampling, with representative samples defined as per ISO (International Organization for Standardization) standards; and (b) Ministerial Resolutions approving EMP and defining the process to be adopted for the systematic update of the Generation and Transmission Master Plan are disclosed in MINEE's website.

27. **DLI 6: Increase in renewable electricity supply to grid-connected and off-grid consumers.** This DLI tracks progress in increasing the share of renewable energy in the electricity generation mix through public and private investments. Through this DLI, the Program supports the installation of solar PV electricity generation capacity, mainly but not exclusively in geographic areas of the north system (RIN), with the main purpose to reduce the load factor of diesel-fired thermal generating units predominantly used for electricity supply to consumers in the system, significantly lowering high related operating costs and CO₂ emissions. The public investments procured by MINEE are expected to add 22 MW of solar PV installed generation capacity in the existing and eventually some new isolated systems. MINEE will install solar PV generation capacity in the sites of less than 10 existing diesel fired thermal plants with low installed capacity (1-2 MW each), which supply electricity to isolated systems or to the national interconnected system, to replace part of thermal production with solar PV generation. This arrangement is known as "hybridization" of thermal plants, and has clear economic advantages, as well as reduction of local pollution and of CO₂ emissions. Installation of solar PV generation capacity does not imply any construction works outside the site where each plant is located. It will also allow to provide electricity service to currently unserved areas through mini-grids powered with solar PV. Additional capacity may be eventually installed through ongoing private initiatives.

28. DLR 6.1 requires that MINEE adopt and publish an updated Generation, Transmission, and Distribution Master Plan including those actions.

29. **Verification protocol.** The PIU shares the reports on renewable energy supplied by additional generation capacity from solar PV plants installed in isolated systems bi-annually. IVA verifies: (a) total annual generation from additional solar PV systems commissioned after the Program approval dates by carrying out physical inspection of new solar PV generation facilities and checking data loggers; and (b) MINEE has issued and disclosed a resolution adopting an updated Generation, Transmission and Distribution Master Plan.

30. **DLI 7: Increase in available transformation capacity in transmission substations operated by SONATREL.** This DLI refers to the elimination of bottlenecks and other issues in the existing transmission infrastructure operated by SONATREL that affect the quality and reliability of transmission services, and limit electricity consumption of large users, despite the availability of sufficient generation capacity.

31. For that purpose, DLR 7.1 requires ARSEL to review and approve SONATREL's PIP of, including an investment plan for rehabilitation and upgrade of existing transmission infrastructure. Projects could include increases in installed transformation capacity, replacement of ageing and/or unreliable equipment (transformers, switchgear, and so on), upgrade of protection and control systems



incorporating state-of-art digital technologies, installation of equipment (reactive power compensators and banks of capacitors) to optimize energy flows and use of its transmission capacity, and so on. As a minimum, the Program will target investments in the approved PIP aimed at increasing installed and available transformation capacity in the existing substations by at least 2 percent per year, to maximize positive impacts on quality and reliability of transmission services while at the same time minimizing safeguards risks. To ensure enforcement of the PIP, DLR 7.2 requires that the GoC and SONATREL's Board sign an updated performance contract, incorporating the plan as approved by ARSEL.

32. **Verification protocol.** MINEE shares the annual reports issued by SONATREL on transformation capacity added to the existing substations in the transmission system operated by SONATREL. IVA verifies that: (a) new/upgraded transformers reported in SONATREL's annual reports on transformation capacity added to existing HV substations, are operational by carrying out physical inspection; (b) ARSEL has issued a resolution approving SONATREL's PIP; and (c) GoC and SONATREL's Board have signed and updated Performance contract incorporating the PIP approved by ARSEL.

Climate Co-Benefits and Paris Alignment

33. This section highlights the corporate climate commitments of the project while it highlights how every activity under the mentioned DLIs will help in GHG emissions. It can be ascertained that the activities under this project have been considered for Paris Alignment and are in line with Cameroon's long term NDCs objectives.

34. **DLI 1: Reduction of annual revenue gap between maximum allowed revenues and tariff revenues, expressed as a percentage of MAR.** The adjustment of tariff for customers who currently benefit from subsidized power will help improve financial viability of the sector. This will in turn facilitate reinvestment into transmission and development infrastructure, helping reduce technical losses, and therefore improve overall energy efficiency. Improving energy efficiency directly results, whether from the network or generation, in a reduction of GHG emissions. This DLI contributes toward climate mitigation under the Multilateral Development Banks' list of eligible mitigation activities under Category 13. Commercial and collection loss reduction in distribution of electricity. Activities under this DLI are of reducing annual revenue gaps, will promote rather than prevent the energy transition, and reduce transition risks, making them aligned with the mitigation goals of the Paris Agreement.

35. **DLI 2: Timely payments of public administration's electricity consumption and annual compensation by Ministry of Finance to ENEO, as per applicable regulatory framework.** Instilling rigor and discipline in the payment mechanism from the state to the distribution network will address the current situation of payment arrears that is causing liquidity issues within the sector and thereby promote financial viability of the sector. This DLI will support the correct carbon pricing mechanism. This will also facilitate reinvestment into infrastructure and reduce technical and financial losses, thereby improving energy efficiency and reducing GHG emissions as an indirect benefit. Furthermore, the timeliness of payments will influence energy consumption reducing excessive consumption by public customers, which in turn would improve financial energy-efficiency and enhance savings. Similarly, to previous DLI, activities under this DLI will also promote rather than prevent the energy transition, and reduce transition risks, making them aligned with the mitigation goals of the Paris Agreement.



36. **DLI 3: Public facilities with functioning smart meters and public lighting with functioning smart meters.** Installing meters directly contributes to getting better data and better monitoring of electricity consumption as well as identification and quantification of technical losses across the distribution network, which leads to improved efficient energy use and reduced technical losses. The installation of meters also allows ENEO to accurately bill public facilities for their consumption, which induces a more rational use of energy by customers, compared to unmetered public facilities. Activities under this DLI include installing smart meters and energy efficient public lighting LED lamps and increasing reliability of power supply, which are in alignment with general principles for brownfield energy efficient activities for climate mitigation. Furthermore, improved energy management and data gathering of key energy indicators and GHG emissions will contribute to more efficient energy use and reduce commercial loss reduction of electricity from demand-side management. Activities under this DLI will reduce energy consumption by appliances and equipment while delivering the same level of service is essential for decarbonization. Therefore, activities under this DLI are from the list of universally aligned activities under the Paris Agreement's mitigation goals.

37. **DLI 4: Reports on regulatory audits of performance of ENEO and SONATREL are completed and published annually.** Within the scope of climate mitigation, an audit of ENEO's operational performance will result in an improvement in energy management and data gathering of key energy indicators and will contribute to more efficient energy use, thereby reducing GHG emissions. These audits will help ensure energy efficiency given that it will enforce that new connections are made according to established standards, quality of services KPI would help ensure a minimum quality of service in order to reduce the use of diesel backup generators by customers. Increased network understanding and more efficient network operation also allows for the integration of climate risks into decision-making. Furthermore, these audits will help ensure that key KPIs pertaining to technical losses are adhered to, thus improving energy efficiency⁶⁶. Activities under this DLI are going to help improve data for future decision making, enhance overall energy efficiency, and no scope 1 emissions. Therefore, activities under this DLI can be considered aligned with Paris Agreement.

38. **DLI 5: Households provided with new electricity service.** As with DLI 2, instilling rigor and discipline in the payment mechanism from the customers to the distribution company will address liquidity issues, promoting the financial viability of the sector. Increasing access to clean energy displaces GHG emissions in that it reduces the need for populations to meet their energy needs through carbon-intensive fuels: diesel or kerosene solutions. The use of planning tools, and their subsequent implementation, in reaching these populations also factors in climate resilience considerations. Activities under this DLI, will increase the use of renewable energy and reduce GHG emissions, by increasing access to renewable energy, with negligible life cycle of GHG emissions. It will also reduce dependence on carbon-intensive fuels by the population. Therefore, activities under this DLI are from the list of universally aligned activities under the Paris Agreement's mitigation goals.

39. **DLI 6: Increase in renewable electricity supply to grid-connected and off-grid consumers.** In the case of Cameroon, investing in hydro power through this DLI will be important in light of the increasing severity of dry seasons and will help improve resilience towards flooding.⁶⁷ Furthermore, investing in solar

⁶⁶ Ensuring technical losses are below a certain pre-agreed limit is a condition of any concession agreement, and not a weighted criteria.

⁶⁷ World Bank. 2014. Understanding the impact of climate change on hydropower : the case of Cameroon - climate risk assessment for hydropower generation in Cameroon



PV, will increase the climate adaptability of electricity services. Additional electricity generation capacity generation helps meet demand and displace generation that might have otherwise come from high carbon sources such as diesel gensets, contributing to decarbonization efforts of the country. Like last DLI, activities under this DLI, will increase the use of renewable energy and reduce GHG emissions, by increasing access to RE, with negligible life cycle of GHG emissions. It will also reduce dependence on carbon -intensive fuels by the population. Therefore, activities under this DLI, are from the list of universally aligned activities under the Paris Agreement’s mitigation goals.

40. **DLI 7: Increase in available transformation capacity in transmission substations operated by SONATREL.** Under climate mitigation, the sharing of the operational performance of SONATREL (and follow-up) on improvement in transformation capacity will result in an improvement in energy management and data gathering of key energy indicators and will contribute to more efficient energy use. This contributes to a reduction of GHG emissions. Furthermore, an increased network understanding, and more efficient transmission network operation, allows for the integration of climate risks into decision-making. This increase in transformation will also consider climate resilience in the transmission infrastructure, such as flood-resistant structures at elevated platforms and using metal poles in places prone to wildfires. The rehabilitation of transmission capacity activities under his DLI will help in improvement of energy management and efficiency. It will lead to an overall reduction of GHG emissions. Therefore, activities under this DLI, are from the list of universally aligned activities under the Paris Agreement’s mitigation goals.

Economic Analysis

41. This section discusses the rationale for public financing of the Program and the value added from the World Bank’s support and presents the analysis of the Program’s development impact in terms of expected benefits and costs. The economic analysis is conducted for key areas of the Government program that are supported by World Bank financing.

Rationale for Public Sector Provision/Financing

42. The GoC has spearheaded a reform process to improve efficiency, performance, and the fiscal impact of the electricity sector. However, sector reforms have not brought the expected results to the population due to weak planning by the Government, insufficient financial resources for the sector, and mediocre operational performance by ENEO. In particular, there is a strong justification for the use of public financing for this Program on the following grounds:

- (a) The PforR will focus on priority reforms that address the sector fundamentals, which will have a positive ripple effect in improving payment discipline, expanding renewable generation capacity, enhancing energy access, increasing energy efficiency, and building transmission infrastructure.
- (b) The PforR addresses urgent issues in the energy sector where key reforms are required to alleviate the fiscal burden of inadequate tariff regulation, improve sector financial viability, and strengthen institutional capacity to increase electricity access.
- (c) The PforR supports the financial sustainability of the power sector, by moving toward full cost recovery for MV and HV customers, improving the cash collections in the sector to reduce arrears, reducing the cost of generation through hybridization of thermal plants, and increasing the consumer base through efficient service delivery for industrial customers.



Value Added of the World Bank's Support

43. The World Bank Group can play a valuable role in the reform process by
- (a) Providing financing to help ensure that measures to improve financial viability of the sector are undertaken;
 - (b) Sharing international knowledge and experience on how power sector reforms have been implemented across the world and incorporating international best practices in the process;
 - (c) Making long-term concessional financing available for strengthening the electricity sector; and
 - (d) Providing technical assistance and capacity building support to key stakeholders.

Counterfactual to Cameroon's Power Sector Reform Program

44. This economic analysis considers a number of assumptions to define the counterfactual or without program scenario: (a) in the absence of grid-based electricity, rural households use diesel and kerosene as alternative sources of electricity and lighting; (b) industries self-generate electricity using diesel; (c) streetlights use incandescent lights and are not accurately metered; and (d) there is no increase in solar PV capacity.

Cost-Benefit Analysis of Cameroon's Power Sector Reform Program: Methodology and Assumptions

45. The economic viability of the Program is assessed through a cost-benefit analysis. Net benefits for the Program were calculated by comparing total system costs and benefits for the 'with Program' and 'without Program' scenarios. A range of scenarios and sensitivities that meaningfully reflect the uncertainties of key input variables are evaluated. The analysis includes a consideration of the relevant environmental externalities.

Program Benefits and Costs

46. The Program covers a range of power sector reforms, which results in the benefits detailed in the following paragraphs.

Increased efficiency of public lighting (DLI 3)

47. One of the objectives of DLI 3 is to improve the metering of public administration and public lighting consumption while introducing energy efficiency measures that will reduce overall consumption and facilitate the timely payment of invoices by the Government. The Program will supply public lighting with functioning meters and LED lamps that will replace incandescent lights in streets and public buildings. The economic analysis captures the reduction in energy demand and GHG emissions as a result of these measures. The analysis considers a total investment of US\$25.6 million. Considering a usage of eight hours per day, will enable the installation of 8.5 MW in LED bulbs. For this analysis, the costs of streetlight replacement are US\$3 per W, including installation, disposal, and metering, and the lifetime is five years.



Increased access to electricity for residential customers (DLI 5)

48. The Program increases electricity access by providing 211,000 additional connections in urban and rural areas. The analysis considers that the capital costs per new connection are US\$500. The variable costs of electricity access relate to the costs of service, which follow the projections shown in Table 3.2.

Table 3.2. Cost of Service Projections (CFAF/kWh)

		2024	2025	2026	2027	2028	2029	2030	2031
Low voltage (LV)	Residential customers	85.1	86.5	80.4	79.7	81.6	75.8	77.4	79.2
Medium voltage (MV)	Industrial customers	53.6	54.9	48.7	49.6	49.3	46.4	45.6	46.1

Source: Cameroon cost of service study, December 2022. Table 25.

49. The economic benefits of electricity access depend on the customers' WTP for electricity. It is defined as the area under the demand curve to the level of consumption observed. Various factors influence the WTP, such as urbanization level, income distribution, availability of alternatives, reliability of the service, value provided, and weather conditions. In any given period and for any given location, each of these factors may have a different weightage, which makes the WTP a concept difficult to quantify. It is known from empirical analysis that for the first kWh of consumption, consumers pay high prices for electricity substitutes, such as kerosene for lighting, candles and torches, and dry cells. The more electricity they consume, their WTP will reduce, until it reaches the level of the tariff. Estimating the WTP requires undertaking household energy surveys in the target area for electrification. Once the demand curve is estimated based on the WTP values at different consumption levels, the net benefits of electricity access can be quantified from the consumer surplus, which is the value of the service to the consumers above what they pay for it.

50. One practical approach to inferring the WTP is to estimate the cost of available alternatives currently used by prospective customers. In the case of well-off customers, this can be related to the costs of self-generation using diesel, which is about US\$0.3 per kWh. In the previous World Bank project, Cameroon-Chad Power Interconnection Project, the WTP for rural customers was US\$0.16 per kWh. The tariff is an observable point on the demand curve. However, it does not take into account the consumer surplus and therefore is considered the lower bound. Table 3.3 summarizes the WTP values relevant to Cameroon.

51. A value of 0.18 is used in this analysis. Given the uncertainties on the WTP, a sensitivity analysis is conducted.

Table 3.3. WTP Estimate Relevant to Cameroon

Value (US\$/kWh)	Category/Source
0.3	Diesel substitution
0.16	Previous WB project Cameroon - Chad Power Interconnection
0.13	Tariff



Expansion of solar PV capacity through hybridization of diesel thermal systems (DLI 6)

52. The Program considers updates in the Generation and Transmission Master Plan to maximize the share of renewable energy in the east and north electricity systems to reduce carbon emissions and generation costs. Given the availability and use of diesel generators, solar-hybrid systems consisting of new solar PV systems integrated with existing diesel generators are an economical configuration for continuous power access. Furthermore, this solar-hybrid configuration helps reduce the negative health and environmental impact on society compared to using diesel generators alone. The Program will replace thermal generation by (a) enabling 22 MW of new solar PV generation capacity and (b) expanding access to clean hydropower. The solar PV systems supported by the Program feature the items shown in Table 3.4.

Table 3.4. Solar PV Systems: Costs and Performance Assumptions

Item	Value	Source
Capital costs	US\$1,148/kW	IRENA 2021. Figures for South Africa
Capacity factor	20%	Project team
Degradation of PV output per year	1%	Other World Bank projects, India Grid-Connected Rooftop Solar Program
O&M costs	1%	—

Note: IRENA = International Renewable Energy Agency.

53. In terms of diesel substitution, the base case scenario considers an oil price of US\$80 per barrel, an economic price ratio of 1.2 between diesel and oil, US\$5 per barrel freight, and a 10 percent distribution margin. This results in an economic cost of diesel of US\$0.7 per liter. A sensitivity analysis evaluates the impacts of these assumptions.

Increased access to electricity for industrial customers (DLI 7)

54. Under DLI 7, SONATREL implements investments to eliminate bottlenecks in the existing transmission systems to enable an increase in the industrial electricity consumption from the grid. By enabling industrial customers to connect to the grid, the Program targets the displacement of 613 GWh of thermal electricity consumption over a four-year period. This will reduce the fuel/variable costs of thermal self-generation, which are about US\$0.2 per kWh. The costs of electricity service for industrial customers (medium tension) follow the trajectory outlined in Table 3.2. The capital investment needed to supply power to industrial customers is estimated to be US\$76.16 million over four years.

GHG Emission Reductions

55. The Program results in relevant GHG emission reductions as a consequence of the various interventions. The analysis includes the following:

- (a) **Solar PV:** GHG reductions due to the displacement of diesel generation with solar PV.
- (b) **Increased electricity access to residential households:** GHG reductions due to the displacement of diesel generation and kerosene with electricity from the grid having lower GHG intensity.
- (c) **Access to industry to grid-supplied electricity:** GHG reductions due to the displacement of diesel from self-generation, with grid-supplied electricity.
- (d) **Public lighting:** Reduced generation due to the replacement of incandescent lights with LED



lights .

56. In accounting for GHG emissions, the emission factors listed in Table 3.5 are considered, which follow the Intergovernmental Panel on Climate Change (IPCC)⁶⁸ (2006).

Table 3.5. Emission Factors

Fuel	CO ₂ (kg/TJ)	CH ₄ (kg/TJ)	N ₂ O (kg/TJ)	CO ₂ e (kg/TJ) ^a
Diesel	74,100	3	0.6	74,343

Note: a. The global warming potential of CH₄ is 28 and N₂O is 265.

57. The shadow price of carbon follows the World Bank’s guidance (Table 3.6). The low carbon price trajectory is used in the main calculations and the high trajectory in the sensitivity analysis.

Table 3.6. Shadow Price of Carbon

		2024	2025	2030	2035	2040	2045	2048
US\$/tCO ₂ e, low	US\$/ton	44	45	50	56	63	70	75
US\$/tCO ₂ e, high	US\$/ton	87	89	100	112	125	140	149

58. The grid emission factor for Cameroon is 0.397tCO₂e per MWh according to the harmonized grid emission factor data set of the UNFCCC.

GHG Emission Reductions of Electrification

59. Grid-supplied electricity substitutes the use of off-grid diesel generation. It also replaces the use of kerosene for lighting, which is a highly inefficient lighting method. The monthly consumption of kerosene in Africa is about 3–30 liters per household. GHG emissions are 2.5 kg CO₂e per liter, which implies that emissions per household are between 0.09 to 0.9 tons per year. Kerosene lamps emit black carbon, raising the lamps’ contribution to climate change substantially. In the absence of detailed household surveys of kerosene use, it is difficult to have a good approximation of what the GHG implications are. In this economic analysis, the team used the emission factor of diesel for baseline energy consumption.

Other Non-Accounted Benefits

60. This analysis excludes multiple important benefits of electrification, including increased returns on education and wage income, improved access to communication and information services, health benefits, and time savings (for example, avoiding trips to buy kerosene or batteries). They are difficult to quantify within the scope of this analysis but represent a significant part of the social benefits of rural electrification. Other benefits not included are (a) reduction in local air pollutants; (b) energy security; and (c) industrial development because of more reliable and cheaper electricity.

Results

61. In addition to the costs and benefits noted in the previous section, the economic analysis rests on the following additional assumptions:

⁶⁸ IPCC, Guidelines for National Greenhouse Gas Inventories, 2006.



- (a) Discount rate for calculation of NPV: 6 percent
- (b) Program lifetime: 25 years
- (c) Implementation schedule: according to table 3.7

Table 3.7. Implementation Schedule (%)

	Year 1	Year 2	Year 3	Year 4
PV generation	0	25	25	50
Electrification	25	25	25	25
Industrial connections to the grid	13	23	30	34
Streetlighting	28	28	28	16

Energy Balance

62. The resulting energy balance is shown in Table 3.8.

Table 3.8. Energy Balance (GWh)

	2024	2025	2026	2027	2028	2029	2030	2031
Solar PV electricity generation	0	10	19	38	38	37	37	37
Electricity sent to new residential customers	51	101	152	203	203	203	203	203
Electricity sent to new industrial customers	67	0147	239	613	613	613	613	613
Energy savings in streetlighting	21	42	62	75	75	75	75	75

NPV, ERR, and GHG Emission Reductions

63. The economic analysis shows that the proposed Program is economically viable with and without consideration of GHG externalities (see Table 3.9). The ERR is 35 percent without consideration of environmental externalities. If GHG emissions are considered, the ERR increases to 40 percent. The NPV of the Program without environmental externalities is US\$744 million. With GHGs it increases to US\$900 million. The lifetime emission reductions are 6 mtCO₂e.

Table 3.9. ERR and NPV

Item	Unit	Value
Discount rate	%	6
ERR	%	35
ERR + GHG externalities	%	40
NPV (before environmental benefits)	[US\$, millions]	744
NPV (including GHGs)	[US\$, millions]	900
Lifetime GHG emissions, undiscounted	[mtCO ₂]	6

Source: https://unfccc.int/sites/default/files/resource/Harmonized_Grid_Emission_factor_data_set.pdf.

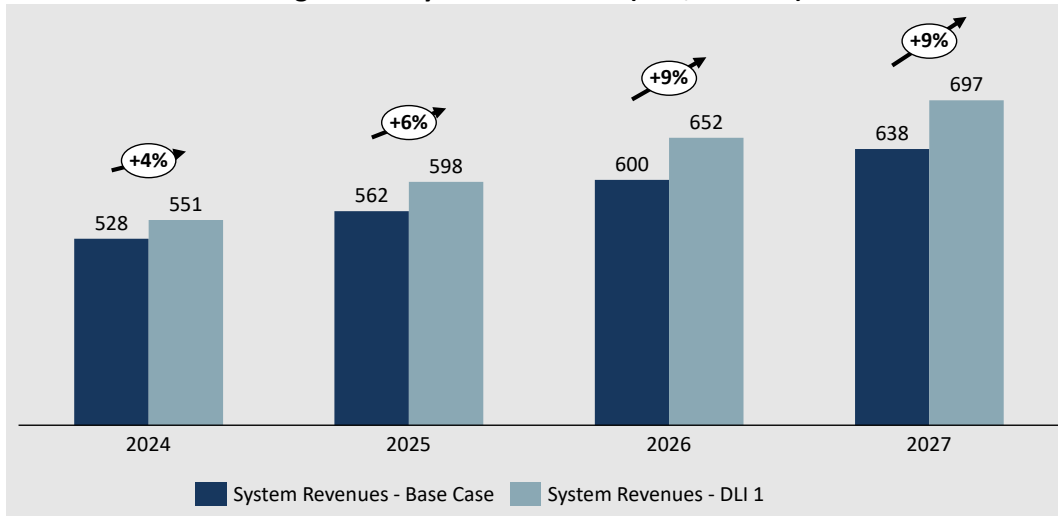
Financial Analysis

64. A financial analysis was performed for the Program to show the impact of implementing the agreed reform actions on the financial health of the sector. The analysis is focused on DLIs where the financial cash flows are easily quantifiable as a result of achieving the agreed results—DLI 1, DLI 2, DLI 6, and DLI 7.



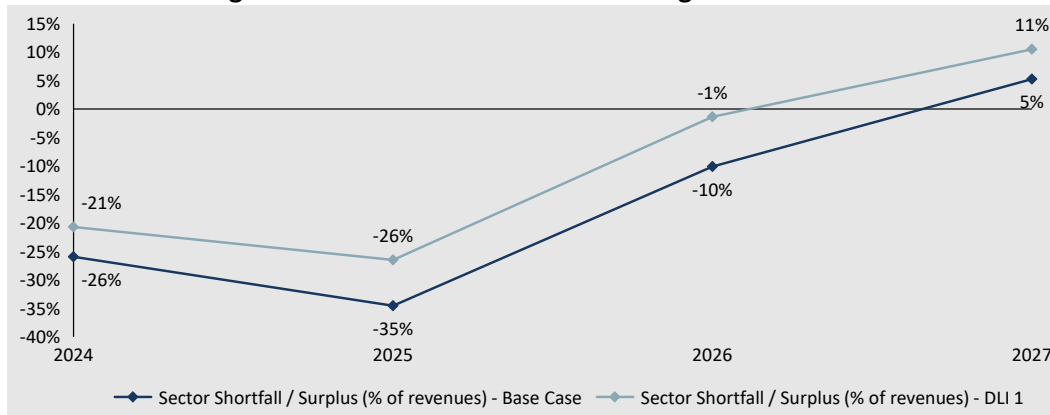
65. For DLI 1, applying cost-reflective tariff rates to MV customers of ENEO (except those classified by GoC as socially sensitive) and HV customers (except ALUCAM) will have the impact of (a) increasing total revenues in the sector by US\$178 million between 2024 and 2027 and (b) reducing the sector shortfall, which in turn will reduce the amount of subsidies that will be paid by the GoC to the electricity sector.

Figure 3.1. System Revenues (US\$, millions)



Source: World Bank, 2023

Figure 3.2. Sector Shortfall as Percentage of Revenues



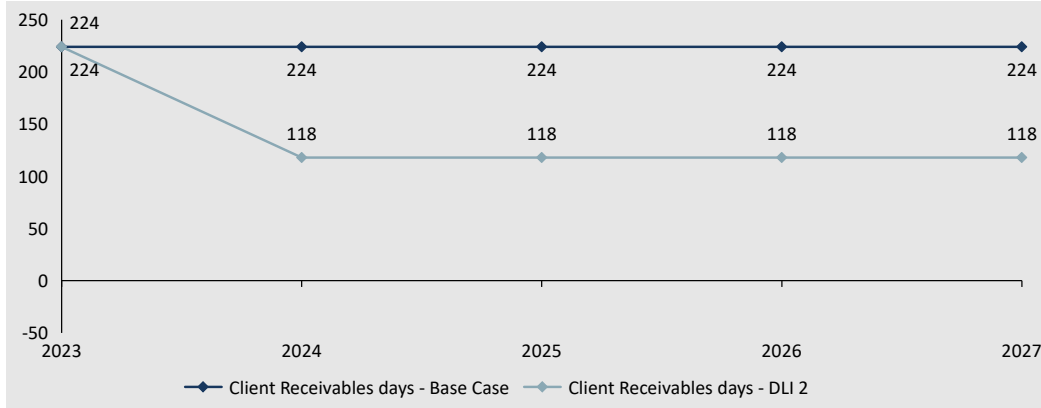
Source: World Bank, 2023

66. A key objective of DLI 2 is the enforcement of payment discipline in the energy sector. The GoC historically pays for its consumption and tariff compensation with significant delay, which contributes to the accumulation of arrears in the sector. This DLI does not cover the timely payment to state-owned enterprises such as ALUCAM and CAMWATER that also have accumulated significant amount of arrears to ENEO over the past years. In addition to paying its own invoices, MINFI is also responsible for paying the bills related to public lighting, which is outside the concession of ENEO but rather managed by the municipalities. Ensuring the implementation of timely payment of the government bills (own consumption, any tariff compensation, and public lighting) will reduce the number of days it takes for ENEO to receive collections from its customers by 47 percent (that is, a reduction from 224 days to 118



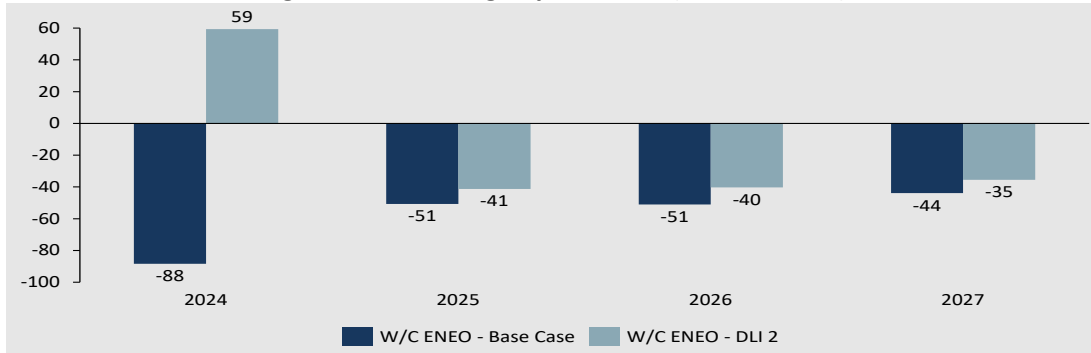
days). This would also improve ENEO’s working capital by 76 percent or US\$176 million over the Program period and reduce the liquidity crunch that the company currently faces.

Figure 3.3. Client Receivables Days



Source: World Bank, 2023

Figure 3.4. Working Capital ENEO (US\$, millions)

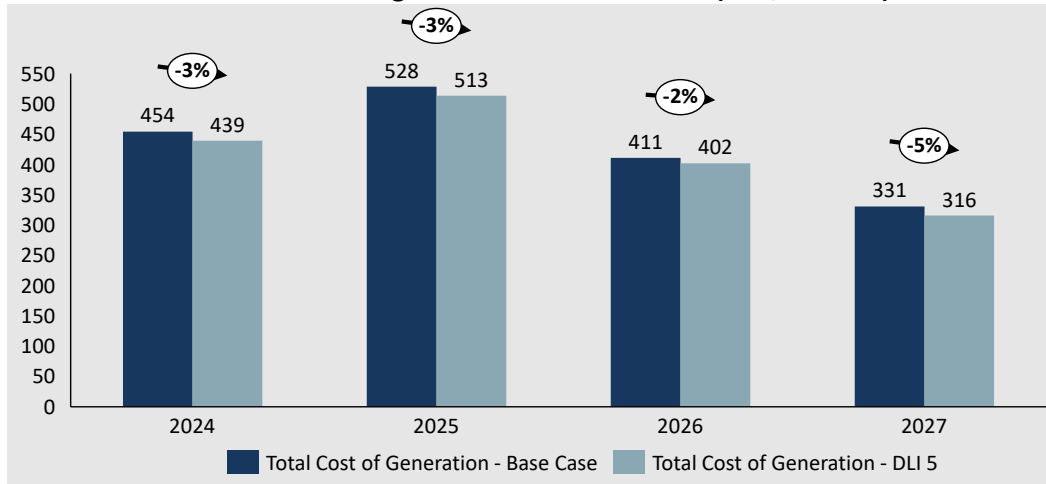


Source: World Bank, 2023

67. Through the addition of renewable energy generation capacity (solar PV) of 22 MW over the life of the Program under DLI 5, the sector has a reduction of 3 percent (or US\$54 million) in generation costs related to the use of fossil fuel-based generation because solar PV will displace the use of liquid fuel in remote areas.



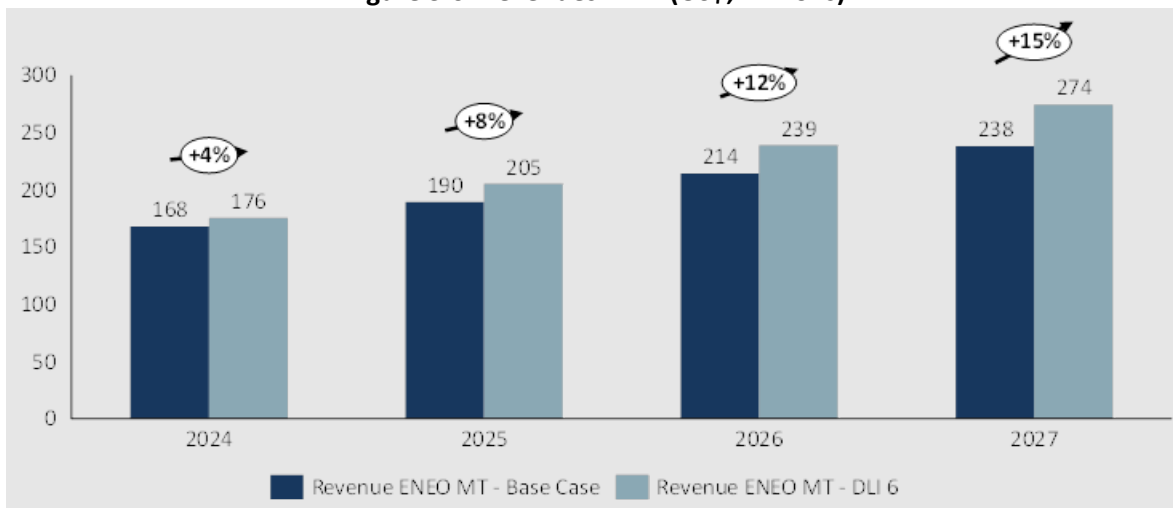
Figure 3.5. Generation Costs (US\$, millions)



Source: World Bank, 2023

68. With an investment of US\$76 million over the life of the Program in DLI 6, SONATREL would be able to reduce the existing bottlenecks in the transmission system, enabling an estimated increase of 613 GWh in consumption by industrial electricity customers from hydro-based generation in RIS. This investment plan would provide an improvement in the system revenues of 10 percent (US\$84 million).

Figure 3.6. Revenues - MV (US\$, millions)



Source: World Bank, 2023

ENEO Corporate and Financial Analysis

69. ENEO has been facing financial challenges over the past few years. The company's revenue from electricity sales has been increasing, but the company is struggling to generate a profit and is facing operational challenges. The company is also having trouble collecting its receivables and paying its payables on time, resulting in negative free cash flows over 2018–2021.



70. Electricity sales have been consistently growing at an average annual growth rate of 3.45 percent over the last four years with a total of XAF 342 billion electricity sold in 2021. The largest contributors are the LV and MV customer categories because these two categories combined represent over 90 percent electricity sales (59 percent LV and 34 percent MV). On the other hand, the high voltage power supply segment has been the smallest contributor to ENEO's total sales, accounting for less than 10 percent of total sales in all four years. The sales for the high voltage power supply segment have also been consistently decreasing at an average 5.4 percent yearly rate, reaching XAF 22 billion in 2021.

71. However, the company's earnings before interest, taxes, depreciation, and amortization (EBITDA) have been decreasing over the past few years, with a margin of only 3.22 percent in 2021, compared to 18.0 percent in 2018. This suggests that ENEO is struggling with its operational profitability. The costs of electricity service in Cameroon are moderate but also volatile, as a result of a reliance on expensive liquid-fueled thermal generation during seasons of low hydrology in the northern region and operators' poor operational performance. Electricity tariffs charged by ENEO, at an average of about US\$0.14 per kWh, stand above the regional average of US\$0.13 per kWh and the regional average for countries with hydro-based power systems of US\$0.10 per kWh. The sector is reliant on subsidies from the GoC because of the freeze on tariffs since 2012.

72. The company's balance sheet shows that its total assets increased over the past few years, from XAF 700 billion in 2018 to XAF 888 billion in 2021. However, this is mostly explained by (a) the delay in receiving annual compensation from the GoC (increase in receivables); (b) inventory buildup; and (c) cash overdrafts, creating cash inefficiencies throughout the period.

73. As of December 2021, arrears from the GoC to ENEO were estimated at XAF 74 billion. In turn, the power suppliers accumulated arrears to their fuel suppliers and financiers creating liquidity problems all along the value chain. This has led to a vicious circle, where ENEO is not generating enough cash to invest and improve its distribution performance (73 percent distribution efficiency in 2021).

74. ENEO's cash flow statement shows a steady investment annual program between XAF 31 and XAF 42 billion between 2018 and 2020, but in 2021 the company accelerated its capital expenditure investments to XAF 67 billion (by acquiring a XAF 100 billion loan from local commercial banks) to tackle urgent safety issues, rotten poles, and network overloading but the company has not developed a comprehensive plan that would allow for a methodic rollout of investments to support the short- and longer-term requirements in the network.

75. In conclusion, the sector reforms have not brought the expected results to the population due to weak planning by the Government, insufficient financial resources for the sector, and mediocre operational performance by ENEO. Debt and arrears in the sector originated from unpaid electricity bills, inadequate subsidy compensation, incomplete regulation, and poor operational performance on ENEO's part derive in sector financial distress. To prevent the re-accumulation of arrears beyond 2023 and improve the sector's financial viability, the GoC has prepared the CESRP highlighting the structural issues in the sector and provided actionable, time-bound recommendations for resolving them.



Table 3.10. ENEO Financials Summary

	Units	2018	2019	2020	2021
Income Statement					
Electricity sale	XAF, billions	298	309	320	342
EBITDA	XAF, billions	53	31	26	11
<i>EBITDA margin</i>	%	18	10	8	3
Net income	XAF, billions	-23	11	6	-36
<i>Net income margin</i>	%	(8)	4	2	(11)
Balance Statement					
Total assets	XAF, billions	700	781	836	888
Account receivable	XAF, billions	191	321	354	324
Account payable	XAF, billions	173	260	331	287
Cash Flow Statement					
CF from operation	XAF, billions	18	26	29	-30
CF from investing	XAF, billions	-31	-42	-38	-67
CF from financing	XAF, billions	7	-1	-31	84
Change in cash	XAF, billions	-6	-18	-40	-12
Working capital ratios					
Days receivable	days	234	379	404	346
Days payable	days	464	549	646	476
Current ratio	#	0.50	0.69	0.62	0.73

Table 3.11. ENEO Financials Summary

	Units	2018	2019	2020	2021
Income Statement					
Electricity sale	US\$, millions	484	502	519	555
EBITDA	US\$, millions	86	50	42	18
<i>EBITDA margin</i>	%	18	10	8	3
Net income	US\$, millions	(37)	18	10	(58)
<i>Net income margin</i>	%	(8)	4	2	(11)
Balance Statement					
Total assets	US\$, millions	1,136	1,268	1,357	1,442
Account receivable	US\$, millions	310	521	575	526
Account payable	US\$, millions	281	422	537	466
Cash Flow Statement					
CF from operation	US\$, millions	29	42	47	(49)
CF from investing	US\$, millions	(50)	(68)	(62)	(109)
CF from financing	US\$, millions	11	(2)	(50)	136
Change in cash	US\$, millions	(10)	(29)	(65)	(19)



ANNEX 4. SUMMARY FIDUCIARY SYSTEMS ASSESSMENT

1. **The Government’s program fiduciary system encompassing procurement, FM, and governance has been assessed by the World Bank against the operational requirement outlined in the PforR Financing Framework.** The IFSA assessed whether the fiduciary system and performance of the Program’s fiduciary system are adequate and provide reasonable assurance that the funds would be used for the intended purposes with due attention to the principles of economy, efficiency, effectiveness, transparency and accountability. The IFSA was conducted in accordance with the principles governing PforR Programs as set out in the World Bank internal guidelines. The IFSA concluded that the Integrated Fiduciary Systems have the capability of providing reasonable assurance that the financing proceeds will be used for intended purposes with the objective of supporting the achievement of the Program objectives. The IFSA has identified potential risks that may affect the achievement of the PForR objectives and proposed mitigation measures.

2. **Key weaknesses and risks identified at the level of the entities involved in the Program are summarized as follows.** The key fiduciary risks under the Program include the following:

- (a) uncompleted set up of the TSA⁶⁹ and persistent liquidity tensions could result in significant delays to respond to requests or payments submitted by MINEE for the Program activities.
- (b) limitation of the CoA capacity, resources, and independence to audit the government’s accounts (jurisdictional missions) could affect its capacity to deliver quality work and submit the program audit report within the set deadline.
- (c) fragmentation of fraud and corruption risk management, unclear leadership role assigned, and weak coordination of several institutions⁷⁰ charged with the mission to prevent and respond to fraud and corruption, combined with lack of knowledge of the PforR requirements regarding the management of fraud and corruption cases.
- (d) limited capacity of the internal audit – General Inspectorate of MINEE- and lack of modern audit tools to carry out risk assessment and risk-based audit.
- (e) lack of capacity of key procurement actors (members of procurement committees and bid analysis subcommittees).
- (f) poor quality of procurement documents (tender documents and tender evaluation reports), which generally leads to unsuccessful tenders.
- (g) governance issues that lead to an increase in the number of complaints during the procurement process and consequently to a more cumbersome contract award process; and
- (h) lack of capacity in contract management.

3. **Mitigation measures.** To mitigate the abovementioned risks, the Program’s design has proposed the following measures:

- (a) The Government to open at the Central Bank a TSA sub-account into which the World Bank and Government program’s advances/contribution will be released to be used in priority the program activities.

⁶⁹ The Government has a timeframe 2022-2024 for the implementation of the TSA. The TSA is not yet fully operational and does not include all the government financial resources. In addition, cash management is weakened by exceptional fund management procedures due mainly to extra-budgetary expenditures. The government tested the new ICT platform developed by the Central Bank for TSA management since late 2022. The new TSA is to be launched in June 2023. The first year for which TSA budget execution reports will be available will be 2024.

⁷⁰ These include CONAC, ANIF, CoA, CONSUPE, TCS, ARMP, MINMAP



- (b) Provisions would be made in the program to support the support the CoA⁷¹ to deliver the program audit report on time.
- (c) The World Bank will sign a MoU with the CELCOR/MINEE to ensure that any allegations on fraud and corruption in the Program are reported timely. CELCOR/MINEE will be responsible for coordinating the investigation of any potential fraud and corruption case that might arise during Program execution. Provisions will be made in the program documents to support CELCOR/MINEE as well and other institutions involved in preventing and addressing fraud.
- (d) The Program will include support activities through Technical Assistance to support capacity building of the General Inspectorate of the MINEE to carry out risk assessment and risk-based audits.
- (e) With the recent approval of the procurement capacity development strategy, the Government has undertaken, with the assistance of the governance World Bank-financed project some steps to implement the strategy for all actors involved in the procurement process and contract management. Such training will benefit the procurement staff involved in the implementation of the Program.
- (f) The Government has approved that existing standard procurement documents, manuals and guides developed with World Bank support under the PEPS will be used during implementation of the PforR.
- (g) Gradual implementation of the COLEPS.

4. The overall residual fiduciary risk is noted as Substantial.

Budgeting

5. The planning and budgeting processes of MINEE are acceptable. The GoC adopted the performance-based budgeting in 2013. The program-based budgeting has been automated on a platform, Program Budget Management Information System (PROBMIS). The 'Direction des Affaires Generales' is in charge of budget execution at MINEE. The PforR expenditures, once approved and signed, will be included in MINEE's budget lines and will follow the national planning and budgeting procedures as for the existing projects.

6. Budget execution, accounting, and reporting procedures are in line with the national ones. The MINEE's budget lines comprise operating and capital expenditures. The budget executions are monitored using the web-based platform PROBMIS. For the past three years, the overall MINEE budget was executed, on average, at 97 percent.⁷² As far as the activities related to the energy component are concerned, the execution rates are as shown in Table 4.1.

Table 4.1. Execution Rates of the Energy Component

	Budget (CFAF, billions)	Actual (CFAF, billions)	% of Budget Execution
2020	46.29	44.76	96.69
Energy supply	35.48	21.05	59.33
Energy access	10.81	23.71	219.36 ⁷³

⁷¹ The CoA has some experiences in auditing some State Own Enterprises accounts, and has audited some African Development Bank financed investment projects

⁷² 96.30 percent in 2021 against 97.86 percent in 2020.

⁷³ Execution rate was mainly driven by a high execution rate of donor-financed operations



	Budget (CFAF, billions)	Actual (CFAF, billions)	% of Budget Execution
2021	68.11	65.41	96.03
Energy supply	47.30	45.14	95.43
Energy access	20.81	20.27	97.40
2022 ⁷⁴	29.99	18.84	62.82
Energy supply	23.42	17.88	76.38
Energy access	6.57	0.96	14.55

Source: Budget Execution Law (*Loi de règlement*) 2021 and 2022 and *Rapport annuel de performance 2022*

Disbursement Arrangements

7. **The Program will mainly use the flow of funds arrangements for the execution of the national budget.** The management of the state's cash flow is weakened by the continued existence of extrabudgetary expenditures difficult to estimate⁷⁵. The funds of the World Bank will be released into a sub-account which is part of the Single Treasury Account at the Central Bank, and managed by the Treasury. The Program's disbursements will be based on the achievement of DLI targets confirmed by an independent verification agent in accordance with the verification protocol. The MINEE with the support of the PIU will prepare the package including the IVA report to be submitted to the World Bank via the *Caisse Autonome d'Amortissement*. If the World Bank finds that the disbursement request meets the terms of the Financing Agreement, the World Bank will disburse the corresponding funds into the proposed sub-account. The procedures will be documented in the program manual.

Auditing - PforR Program Financial Statements Audits

8. The CoA has audited some State Own Enterprises accounts and performance. It signed an MoU with the AfDB to audit 11 AfDB-financed Investment Projects. Some AfDB-financed project audits have been completed. The CoA has agreed to audit the PforR financial statements. The audit reports shall be submitted by the CoA to the World Bank not later than nine months after the end of the fiscal year. In compliance with the World Bank's policy on access to information dated July 2010, the audited financial statement of the Program will be publicly disclosed.

Governance and Anti-Corruption

9. During the past 10 years, an Anti-Corruption Law, which criminalizes fraud, embezzlement, misuse of public funds, influence peddling, party and electoral financing, abuse of public procurement, and nepotism in hiring practices, was passed. The Penal Code was also amended to take into account the appropriate measure to discourage all forms of corruption. The Program's design has considered additional mechanisms to mitigate fraud and corruption risks. It has also increased transparency and accountability in the Program and has set up the GRM. The Government will inform the World Bank of any indication of fraud and corruption and will cooperate with the World Bank in any investigation into indications of fraud and corruption. A protocol will be prepared laying out the roles and responsibilities of the different actors. This protocol will be included in the POM. As part of the Program launch, a

⁷⁴ Data for 2022 should be considered as draft since not yet approved.

⁷⁵ Extra extrabudgetary expenditures during FY2020 amounted XAF 348.1 billion, or 11.1 percent of total spending compared with 8.2 percent in 2019 against a target of 5 percent.



workshop will be organized to inform key stakeholders (CELCOR/MINEE, procurement, internal audit, CONSUPE, CoA, civil society organization, PIU, and so on) on the applicability of anti-corruption guidelines and protocols to be followed.

Implementation Support

10. The World Bank’s will review the agreed PAPs and other mitigations during every mission and agree on an action plan based on the work done by the Program. Continuous support would be given to the client for implementing the PAP. The progress on agreed PAPs will be reviewed and any changes to the action plan will be made during the implementation phase. The mission would review the implementation progress report on a quarterly basis and monitor the findings of the procurement and FM reports. The mission would review the fiduciary risk including relevant legal covenants. The mission would also review the Program expenditures on a regular basis.

11. The team will monitor the following performance indicators shown in Table 4.2.

Table 4.2. Performance Indicators

Indicator	Measure	Timeline
Adequate monitoring of procurement activities	<ul style="list-style-type: none"> Percentage of contracts awarded and completed within the original contract period. Average number of quotations/bids received for each contract No contract exceeds the threshold for high value contracts Number of procurement related complaints received. 	Annually
Adequate monitoring of FM activities	<ul style="list-style-type: none"> Budget allocation according to annual workplan Release of funds on time Payments done on time Program reports generated on time Audits completed on timely basis and reports submitted to the World Bank on time. 	Every mission and annually

Summary of Identified Fiduciary Risks and Mitigation Measures

12. Based on the assessment, the following key risks and proposed mitigation actions (Table 4.3) have been proposed as a PAP or mitigation measure or legal covenant or DLI:

Table 4.3. Key Risks and Proposed Mitigation Measures

Risk/Weaknesses	Mitigation Action	Responsible Entity	Type of Action	Deadline
Unachieved (TSA arrangements. Liquidity tensions could result in the Treasury inability to pay on time requests for payments related to the program activities.	The World Bank contributions will be released into a sub-account open at the Central Bank which will be part of the TSA. Resources in the sub-account will be dedicated in priority to the program activities in the event of liquidity tensions	MoF/MINEE	PAP	During Program implementation
CoA financial audit capacity is limited due	As part of yearly audit preparation requirements, the ToR for the	MINEE/CoA	PAP	Audit Preparation:



Risk/Weaknesses	Mitigation Action	Responsible Entity	Type of Action	Deadline
to resources constraints and this may affect the quality and the timely submission of Program audit report	audit of the program will be agreed upon with the CoA, MINEE and World Bank. A MoU will be developed with the CoA.			During program Implementation. ToR and MoU: Six months after the effectiveness
Fraud and corruption: Risk of fraud and corruption affecting the Program may not be addressed or reported to the World Bank	Establish a fiduciary complaint handling mechanism and elaborate semesterly report. CELCOR/MINEE to share, with the World Bank, information on the allegations of fraud and corruption using a template, to be agreed upon and, on a semiannual basis	MINEE, CELCOR/MINEE	PAP	During Program implementation
Lack of capacity of key procurement actors	Capacity building for all actors involved in the procurement process.	MINEE/ MINMAP	PAP	During Program implementation
Poor quality of procurement documents (tender documents and tender evaluation reports),	The Government has approved that the standard procurement documents, manuals and guides developed with World Bank support under the PEPS will be used during implementation of the PforR.	MINEE/ MINMAP	PAP	During Program implementation
Lack of transparency and governance issues that lead to an increase in the number of complaints during the procurement process	Full implementation of the COLEPS.	MINEE/MINMAP	PAP	During Program implementation



ANNEX 5. SUMMARY ENVIRONMENTAL AND SOCIAL SYSTEMS ASSESSMENT

1. The ESSA was prepared by World Bank through a combination of reviews of existing Program materials and available technical literature, and interviews with concerned government staff, anticipated implementing agencies, non-governmental organizations, regulatory agencies, and energy/electricity sector experts. As part of the operation's appraisal process, consultations have been conducted with government, power sector and civil society organizations. This assessment also considered safeguard performance of projects implemented by the MINEE.

2. The ESSA found that the E&S risks are Substantial. They are related to the potential impacts of the works and reforms to be financed under the PforR. Works comprise capacity increase of HV substations, new connections, hybridization of existing thermal generation facilities and supply to isolated systems to serve currently unelectrified areas, smart meters for public buildings and public lighting and rehabilitation and extension of distributed networks operating at 15 kV or lower voltages (densification) and service connections. Works to be executed for that purpose are usually identified as "grid densification", and include the construction of distribution networks components in urban and peri-urban areas currently having medium voltage (15 kV) lines:

- (a) Extension of 15 kV overhead lines;
- (b) Installation of pole mounted medium to low voltage (15 to 0.4 KV) distribution transformers of different capacities (15 to 400 kVA);
- (c) Extension of low voltage (0.4 kV) overhead lines;
- (d) Construction of low voltage service drops to connect low voltage lines with households and other buildings.

3. Construction of 15 kV and low voltage lines is in general made at the side of public ways, without requirements on rights of way. It's quite usual to use same poles for both lines and to mount medium to low voltage distribution transformers. If small capacity distribution transformers supplying few customers are used (US network topology), LV networks are short and it's economic to build them using twisted cable, which is very resistant to weather events and external aggressions in general, while also creating a less risky condition if it falls to the ground. Grid densification could also include construction of a few 15 kV service drops to connect at this MV level buildings of factories and other facilities with high electricity demand (1-3 MW), which makes supply in LV technically unfeasible. As several appliances of those facilities (motors and others) operate at LV, those new consumers supplied at MV must build inside their premises at their cost a MV/LV substation they will own, as any other equipment used for their productive processes.

4. These works range from low to medium in magnitude, they are site specific, and others are located along existing roads. They pose potential adverse effects to the environment, safety, and human health. These E&S risks and impacts are mostly likely temporary, reversible and they can be mitigated in a predictable manner. The potential environmental risks of works are the generation of electronics and e-waste that may affect the natural environment and public health. Replacement of poles of public lighting and installation of public lighting can involve minimal ground disturbance, including some occupational health and safety risks, such as electrocution and falling from heights. There will be also risks related to procurement of non-energy-efficient IT equipment and meters.



5. Social risks and impacts include (a) lack of adequate and timely stakeholder engagement (access to public information, consultation and concerns and grievances redressing), particularly for non-governmental actors. Provisions allowing citizens to provide their feedback in the public sphere is very limited and usually formal within environmental and social impacts assessments, and citizens feedback is not considered; (b) small but potential disruption of economic activities caused by works of extension of distributed networks operating at 15 kV or lower voltages (grid densification, low-voltage distribution lines and associated low-voltage distribution transformers - usually small-sized mount on poles situated along existing roads, requiring no land clearing and physical displacement) service connections and the upgrade of existing substations (replacement of existing equipment by more performant ones). The “hybridization” of thermal plants, and has clear economic advantages, as well as reduction of local pollution and of CO2 emissions. Installation of solar PV generation capacity does not imply any construction works outside the existing plant site.

6. On the reform side. Although tariff reforms that will be financed by the Program are on MV customers and large accounts, and not on the final consumers, and are already on course, the accumulative impact on the gradually increase of the tariffs for these categories of customers on a year basis until year 2026 can cascade down and impact negatively the final customers, and most disadvantageous or vulnerable social groups can be affected particularly if this is not adequately assessed. Before the implementation of the first part of the reform, ARSEL which is the regulatory agency carried out a study on the impacts of the first leg of tariff reforms on the price of final products of the industry related to years 2022/2023. However, some gaps have been identified on that study. The following are not considered: (a) the Cumulative impacts of the increases until 2026 and (b) the distributional impact on different social groups is not considered. The ESSA recommends the preparation of a suitable PSIA to guide the upcoming reforms

7. This risk classification is also based on the social safeguard performance of projects implemented by the Beneficiary (MINEE). MINEE is implementing several projects in partnership with the World Bank: Nachtigal Hydropower Project (P157734); Hydropower Development on Sanaga River Technical Assistance Project (P157733); Rural Electricity Access Project for Underserved Regions (P163881); Cameroon - Chad Power Interconnection Project (P168185); Electricity Transmission and Reform Project (P152755). The average social safeguard performance of these projects during the past two years is moderately satisfactory. None of the energy agencies have dedicated environmental and social units, staff are limited and mainly on environment risks management.

Purpose of the ESSA

8. The ESSA aims at reviewing/assessing the existing Cameroon’s systems capacities to plan and implement effective measures for environmental and social risks and impact management for the program, and to identify possible measures and actions to strengthen them. More specifically, the ESSA for the PforR Program aims at examining the extent to which the energy sector existing environmental and social management legal and regulatory and institutional systems can guide adequate environmental and social impact assessments, mitigation, management and monitoring of the Program, and incorporate recognized elements of good practice in environmental and social assessment and management.



ESSA Findings

Applicability of Core Environmental and Social Principles to PforR DLIs and gaps

9. The result of this assessment is presented in Table 5.1. Summary of E&S Systems Assessment of the document and summarized as follows:

10. **Core Principle 1: General Principle of Environmental and Social Management.** The ESSA notes that the institutions responsible for environmental and social management still pose challenges to manage adequately E&S risks and impacts. Infrastructure works to be financed by the Program will go through the ESMS that is being recommended in the action plan. Implementation of the country E&S legislation is supported by the Ministry of Environment for the ESIA. The responsible agencies provide services in an anachronistic and time-consuming manner, with a lack of standardization and transparency, poor environmental and social enforcement, analyses, and monitoring. Some of the salient E&S issues include: (a) inadequate E&S staffing and need of capacity building. The main agencies do not have E&S dedicated units. In some cases, E&S Specialists are included in technical units to whom they report directly, causing that their recommendations are not enforced; (b) limited stakeholder engagement for ESIA and reforms. Provisions allowing citizens to provide their feedback in the public sphere is very limited and usually formal within environmental and social impacts assessments, and often citizens feedback is not considered; and (c) limited grievance redress mechanisms to convey concerns and claims; grievance redress mechanism is not foreseen by the national legislation.

11. **Core Principle 2: Natural Habitats and Physical Cultural Resources.** The ESSA highlights that the activities supported by the PforR component are not expected to involve large civil works which may lead to significant adverse impacts on natural habitats and cultural heritage. It is not expected that the Program will have any impact on natural habitats and physical cultural resources because proposed works are not large civil works and consist only on new connections in peri-urban and rural areas and upgrading existing infrastructures in Sahelian area with no vegetation inside. They include extension of distributed networks operating at 15 kV or lower voltages (densification) and service connections, the upgrade of substations and; small-scale solar PV mini-grids. In addition, the Program will support replacement of thermal generation by enabling 22 MW of new solar PV generation capacity and expanding access to clean hydropower. Solar PV infrastructure to be constructed are located in the right of way of existing thermal plant.

12. **Core Principle 3: Public and Worker Safety.** The supported activities are not expected to involve works under significant risky and unsafe workplace conditions. The supported works of mostly rehabilitation and upgrading existing infrastructure including i.e., extension of distributed networks operating at 15 kV or lower, solar plants hybridization and the upgrade of substations that are not of large scale, thus they are not expected to entail high or substantial risky and unsafe workplace conditions. These works may lead to health and safety risks to the community and workers, including SEA/SH. During the works, populations and workers might be exposed safety risks. In addition, operation of these infrastructures can contribute to public exposure to electric accidents. The Cameroonian labor regulatory framework comprises standards of occupational health and safety (OHS), but still with challenges in terms of application. Cameroonian labor regulatory framework comprises standards of OHS. The national legislation on OHS are quite well developed. The following texts can be listed: (a) Law no. 92/007 of August 14, 1992, on the labor code; (b) Decree No. 75/740 of November 29, 1975, setting the conditions for the



organization and operation of the National Commission for Occupational Health and Safety; (c) Order N° 039 /MTPS /IMT of November 26, 1984, fixing the general measures of hygiene and security on the workplaces. However, these regulations have identified gaps such as low levels of minimum wages and health insurance as well as low rates of enforcements on the ground.

13. Moreover, this framework does not include major ESS2 requirements. Overall, regulations require public and private employers to develop and provide training to their employees on preparedness and response to emergency plans, environmental risk prevention programs, and occupational health and medical control programs. In addition, there are other two gaps. One of them is related to GBV, country context assessment on GBV: SEA/SH shows inadequate legal framework in preventing and responding GBV cases. There are no civil remedies for GBV cases, but they are referred to judicial sphere, lack of referral pathway protocols and services providers for GBV: SEA/SH response. This poor baseline conditions on GBV: SEA/SH can be exacerbated by the Program activities. According to the exclusion criteria list, areas affected by insecurity are excluded from the program.

14. **Core Principle 4: Land Acquisition. The activities supported by Program may have direct adverse impacts related to land acquisition and involuntary resettlement.** Infrastructure works that will cause land acquisition and/or physical resettlement or the use of forced evictions are excluded from the Program. Only small scale of temporary economical displacement associated to the “grid densification” could be present in the program. Grid densification that includes the construction of distribution networks components in urban and peri-urban areas currently having medium voltage (15 kV) lines are on the existing right of way, then disruption of the economical incomes, if any, will be temporary. Cameroon E&S system shows gaps with the requirements set by Core Principle 4.

15. The juridical arsenal on land acquisition in Cameroon is large but outdated and presents these main gaps with the World Bank policies: eligible project affected persons are those who have formal legal rights on land, squatters are not eligible for any compensation or assistance; valuation method of affected land and assets is not at replacement cost; economic displacement is not eligible, livelihoods restoration assistance is not foreseen, payment of compensation prior to vacation of the right-of-way by occupants is not systematically done. In addition to the Ministry of State Property and Land tenure, which is national agency in charge of land expropriation and compensations, there are other sectoral agencies, at national and local levels that conforms the Census and Valuation Committee that make lengthy and long process to obtaining the decrees of expropriation and compensation for affected people, which mandatorily requires an Inter-ministerial Committee to carry out, and the GoC has been facing difficulties to mobilize resources for the valuation of losses and payment of resettlement compensations are other of the problems related to resettlement management in Cameroon. However, land acquisition is not anticipated within the framework of this Program.

16. Sub projects (upgrading or rehabilitation works) to be financed by the Program will be selected and agreed upon resettlement screening jointly with other E&S risks as per the ESMS provisions as recommended in the action plan. MINEE will submit its proposed investment list assorted with a screening report on a yearly basis. The IVA will review the screening report and advise if the selected subprojects respect the exclusion criteria list.

17. **Core Principle 5: Social Considerations – While activities supported by the Program are not expected to cause adverse impacts on Indigenous Peoples by impacting their land, knowledge, cultural**



heritage; or cultural, ceremonial, or spiritual aspects of their lives, they and vulnerable peoples can be negatively impacted by the Program tariff reforms. In alignment with Bank PfoR guidance, the following activities that would impact Indigenous Peoples are excluded from the program. They are activities that would (a) have adverse impacts on land and natural resources subject to traditional ownership or under customary use or occupation; (b) cause relocation of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities from land and natural resources that are subject to traditional ownership or under customary use or occupation; or (c) have significant impacts on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities' cultural heritage that is material to the identity and/or cultural, ceremonial, or spiritual aspects of the affected communities.

18. **Core Principle 6: Social Conflict.** The Program could lead to marginalization of social groups and exacerbation of conflicts among social groups if the reform that will be supported by the Program is not duly assessed and adequate measures are not taken as needed. Although tariff reforms that will be financed by the Program are on MV customers and large accounts, and not on the final consumers, are already on course (Decision N°000000427D/ARSEL of December 12, 2022), the accumulative impact on the gradually increase of the tariffs for these categories of customers until year 2025 can cascade down and impact negatively the final customers, and most disadvantageous or vulnerable social groups can be affected. Prior to this Decision 2022, ARSEL, the regulatory agency, carried out an impact of tariff adjustments on the final end user products. The presentation on this study states that it is based on tariff increases applied in 2022 /2023 and on the price of the product at the time of the analysis (e.g., beer, flour, cement). Conclusion of the study, as shown in the presentation, is that the proposed increase should lead to a maximum increase in the price of a 50 kg bag from XAF 3.4 to 4.7. After the first reform this year 2023, ARSEL and MINEE held consultation with these MV customers, and they finally came to an agreement that no price increase was required. However, some gaps have been identified on that study. The following are not considered: (a) the Cumulative impacts of the increases until 2026 and (b) the distributional impact on different social groups is not considered. The ESSA recommends the preparation of a suitable PSIA. PSIA results will guide the upcoming reforms.

19. **The ESSA concludes that the Program will be developed in a legal or regulatory environment that poses challenges.** While the regulatory framework related to environmental due diligence is overall adequate, enforcement is weak. On the social front there are not established mechanisms to foster transparency, social control, and accountability. Social participation in policy decision-making is not an integral part of the public governance of the energy sector.

20. **The ESSA also concludes that the Borrower's and the implementing agencies' experiences in developing programs and projects of the same level of complexity are relevant, but their track record regarding E&S due diligence has not been satisfactory.** There are concerns related to their capacity and commitment and track record in relation to stakeholder engagement. The technical and institutional capacity of the Borrower, its track record, and the financial and human resources available for management of the PforR and its E&S risks and impacts will need gap filling measures. No legal or regulatory framework changes are needed before the operation can proceed.



Proposed E&S Program Action Plan

21. Specific measures are recommended and required to ensure adequate management of the envisaged E&S risks and the following Action Plan was agreed to enhance the Borrower’s Environmental and Social Risk Management System. Some of these actions will be supported by the IPF component of the Program. The PIU will record evidence of compliance with the E&S of implementing agencies.

Table 5.15. Summary of Gaps per Core Principle and Proposed Actions

Summary of Gap per Core Principle	Action/Responsible	Timeline
Core Principle 1: General Principle of Environmental and Social Management. The ESSA notes that the institutions responsible for environmental and social management still pose challenges to manage adequately E&S risks and impacts. Some of the salient E&S issues include:		
(a) inadequate E&S staffing in PforR implementing agencies, including lack of specialized E&S unit in MINEE, and need of capacity building.	MINEE, ENEO, SONATREL, ARSEL, EDC designate and maintain throughout Program implementation an environmental and a social specialist as further detailed in the ESMS.	Within 30 days after the Effective Date.
	MINEE creates a dedicated E&S unit to strengthen E&S capacity of the sector. This unit coordinates activities with other PCUs involved in the program as further detailed in the POM. MINEE includes costs associated to the dedicated E&S unit in the program Budget for the first two years.	Thirty days after the Effective Date. The new E&S unit at the MINEE will start operating in 2024.
	MINEE organizes and delivers trainings to E&S specialists from, ENEO, SONATREL, ARSEL, EDC	Throughout the Program.
	MINEE prepares an Environmental and Social Management System as per vetted terms of reference by the World Bank.	90 days after effective date and in any case not before the start of works
(b) Limited Capacity of the Beneficiary on E&S Management	MINEE shall adopt and maintain the ESMS throughout the Program implementation period.	90 days after effective date and in any case not before the start of works
	Trainings staffs on the ESMS	Throughout the Program.



Summary of Gap per Core Principle	Action/Responsible	Timeline
(c) limited stakeholder engagement for environmental and social impacts assessment and planning and reforms	MINEE, ENEO, SONATREL, ARSEL, EDC implement the Stakeholder Engagement Plan of the Operation (Program and Project) to explain the changes occurring in the sector and contribute to a better understanding and adherence of reforms by key stakeholders, including active citizens engagement.	At Project Effective Date, and, thereafter, throughout Project implementation.
	ARSEL incorporates results of the study on the distributional impacts and affordability of tariff adjustments in electricity sector (PSIA) that will be prepared under action related to Core Principle 1:	Within 90 days after the Effective Date. Prior to the upcoming reforms. SEP updated with results of the study should be within 30 days of Survey completion.
	MV customers satisfaction survey to strengthen stakeholder consultation of electricity regulatory process	By December 2025.
(d) limited grievance redress mechanisms to convey concerns and claims	MINEE, ENEO, SONATREL, ARSEL, EDC implement the GRM of the Operation that is part of the Stakeholder Engagement Plan of the Operation	At Project Effective Date, and, thereafter, throughout Project implementation.
Core Principle 2: Natural Habitats and Physical Cultural Resources.		
The ESSA highlights that the activities supported by the PforR component, which are mostly upgrading on existing infrastructure, are not expected to involve large civil works which may lead to significant adverse impacts on natural habitats and cultural heritage.	Activities that can impact Natural Habitats and Physical Cultural Resources are excluded from the Program.	NA
Core Principle 3: Public and Worker Safety. The supported activities are not expected to involve works under significant risky and unsafe workplace conditions. However, main gaps are identified in the national systems are as follow:		



Summary of Gap per Core Principle	Action/Responsible	Timeline
<p>The national legislation on OHS are quite well developed. The following texts can be listed: (a) Law no. 92/007 of August 14, 1992, on the labor code; (b) Decree No. 75/740 of November 29, 1975, setting the conditions for the organization and operation of the National Commission for Occupational Health and Safety; (c) Order N° 039 /MTPS /IMT of November 26, 1984, fixing the general measures of hygiene and security on the workplaces.</p> <p>However, these regulations have identified gaps such as low levels of minimum wages and health insurance as well as low rates of enforcements on the ground.</p> <p>Moreover, the legal framework in preventing and responding GBV cases is inadequate. There are no civil remedies for GBV cases, but they are referred to judicial sphere, lack of referral pathway protocols and services providers for GBV: SEA/SH response.</p> <p>The notion of community workers is not clearly defined. Only the high-intensity labor methods is outlined in the national framework, especially the Decree 2018/366 of June 20, 2018 on the Public Procurement Code. However, this decree does not give define conditions of the use of these workers (remuneration, OHS, etc.)</p>	<p>MINEE includes a chapter in the ESMS on labor management procedures applicable to the program: compiling the provision of the national systems added to the gap filling measures.</p> <p>These specific labor management procedures shall be integrated into the implementing agencies Standard Operating Procedures (especially ENEO, SONATREL EDC and AER. Training on OHS for implementing agencies</p>	<p>90 days after effective date and in any case not before the start of works</p>
<p>Poor baseline conditions on GBV: SEA/SH that can be exacerbated by the Program activities.</p>	<p>MINEE includes a chapter in the ESMS on GBV: SEA/SH compiling the provision of the national systems added to the gap filling measures.</p>	<p>Within 90 days after the Effective Date</p>
<p>Core Principle 4: Land Acquisition. The activities supported by Program may have direct adverse impacts related to land acquisition and involuntary resettlement and Cameroon E&S system presents:</p>		
<p>(a) Gaps with the World Bank policies include not eligibility of economical displacement.</p>	<p>MINEE includes a chapter in the ESMS on livelihoods restoration for potential economic displacement.</p>	<p>90 days after effective date and in any case not before the start of works</p>
	<p>MINEE has published (...) a Completion report of the implementation of actions recommended on livelihoods restoration under ESMS.</p>	<p>Before the start of associated works.</p>
	<p>IVA will verify the compliance with livelihoods restoration chapter of the ESMS prior to</p>	<p>At the end of the execution of associated works.</p>



Summary of Gap per Core Principle	Action/Responsible	Timeline
	the disbursement under the DLI5, DLI6 & DLI7.	
Core Principle 5: Social Considerations – While activities supported by the Program are not expected to cause adverse impacts on Indigenous Peoples by impacting their land, knowledge, cultural heritage; or cultural, ceremonial, or spiritual aspects of their lives, they and vulnerable peoples can be negatively impacted by the Program tariff reforms.	ARSEL submits ToRs of the PSIA to the World Bank for approval	Before the Effective Date.
Core Principle 6: Social Conflict. The Program could lead to marginalization of social groups, the exacerbation of conflicts among social groups, or social unrest if adequate measures are not taken. Tariff reforms may lead to social conflict due to its disproportionate impact on the affordability and well-being of the poor and vulnerable. The subsidies may not have necessarily benefited the poor and most vulnerable due to, among other reasons, lack of adequate indicators to identify vulnerable groups.	ARSEL carries out the study on distributional impacts and affordability of tariff adjustments in the electricity sector (PSIA).	90 days after project effectiveness. Prior to the upcoming reforms.
	A strong communication plan as part of the Stakeholder Engagement Plan should be in place to avoid the disproportionate impact of policy reforms on the well-being of most poor and vulnerable people.	120 days after project effectiveness.

Information disclosure and stakeholder consultation

22. Information disclosure and stakeholder consultation carried out with regard to the PforR. The draft ESSA Report was disclosed, and consultations carried out during its preparation by the World Bank’s staff with key stakeholders and will continue during implementation. So far, the ESSA Consultation Plan includes Governmental power sector agencies, Experts in the sector of energy; Non-governmental organizations, including those of energy users and climate change. The operation will continue to engage stakeholders through information disclosure, communication, and GRM as foreseen in the SEP.

23. Previous consultation on the main issues of the energy sector before the PforR preparation, include interviews with government staff, regulatory agencies, regulatory agencies, and sector experts. Cameroon’s Power Sector Key Stakeholder Consultations related to the PforR, were carried out during the period of February 6-10, 2023. These consultations are part of the Consultation Plan of the Program and were conducted by the World Bank with the support of MINEE.

24. The objectives of these consultations were meant to:

- (a) Provide meaningful opportunities to engage Program stakeholders with information on the Program's scope, timeline, expected impacts and proposed management actions.
- (b) Request input, feedback and/or confirmation from stakeholders on the factual basis and assumptions used to prepare the Environmental and Social System Assessment report, for example, with respect to the application of laws and regulations in the practice.
- (c) Provide an opportunity for stakeholders to seek clarification based on any judgment made by the



World Bank on the adequacy or acceptability of any aspect of the program's E&S effects or proposed management measures; and

- (d) Provide an opportunity for stakeholders to suggest alternative E&S risks and impacts management measures as necessary.

25. Participants of these consultations included representatives from: SONATREL; AER; ENEO; ARSEL: and PIUs of the projects financed by the World Bank and implemented by SONATREL and AER.

26. **Results of consultations.** The six entities consulted expressed their strong support for the program. They listed positive economic, environmental and social impacts that would be generated by the program, including the creation of income-generating activities in rural areas, the reduction of gas emissions, the improvement of electricity policies, the development, etc. Other main points are:

- (a) **Stakeholder engagement.** Need to adopt a good communication strategy including better dissemination of relevant information; communication dimension of the E&S aspects of activities must be improved; enterprises hardly respond to requests of the regulator; a mechanism so that the customers feedback is considered in terms of reference, studies and plans are effectively considered is needed; it is necessary to raise awareness on the importance of monitoring community assets and others
- (b) **Institutional arrangement for E&S management.** Non -objection of MINEE and ARSEL prior to that of the World Bank is recommended; a single E&S focal point for the program, who will be responsible for communicating information, convening meetings, etc. is desirable; a single body to be in charge of waste management of the program is also needed; more ownership and attention to E&S aspects when preparing projects is needed in general and ensure that the investment plan package is complete before validation of the investment plan, in particular the costs of the environmental and social aspects.
- (c) **Other points included:** better understanding of the Program design, DLIs and which pertained to each of the involved agency; climatic risks leading to the destabilization of networks due to flooding (in the Far North for example); need to put in place aa communication strategy to facilitate the acceptance of new smart meters and also the planned reforms; involuntary resettlement, cascading repercussions and negative impact on the most vulnerable people, production of electronic waste, minimal disturbance of the sun, pollution of the natural environment and risks to public health, hydrological risks, climatic risks etc.



ANNEX 6. PROGRAM ACTION PLAN

Action Description	Source	DLI#	Responsibility	Timing		Completion Measurement
Approve BIP to improve: (i) accuracy of billing of electricity consumption of public facilities (including supply and installation of smart meters to all facilities); and (ii) metering of electricity consumption of public lighting	Technical		MINEE	Due Date	01-Jul-2024	Report
The MINEE to ensure a Program Operation Manual is maintained current during the program implementation	Fiduciary Systems		MINEE	Recurrent	Yearly	Report on the internal control issued by the external audit
The MINFI to open a sub-account at the Central Bank which will be part of the of the Treasury Single Account (TSA) to receive the the Bank contributions	Fiduciary Systems		MINFI	Other	By the disbursement of funds	Bank reconciliation statements
The Chamber of Accounts to audit the program financial statements on the basis of ToR and MoU with MINEE acceptable to the World Bank.	Fiduciary Systems		Chamber of accounts	Recurrent	Yearly	Copy of the audit report
The CELCOR/MINEE to inform WB off all credible allegations or other indications of fraud and corruption in	Fiduciary Systems		CELCOR/MINEE	Recurrent	Semi-Annually	Report from CELCOR/MINEE on information on the allegations of fraud and corruption



connection with the Program that come to their attention, and the investigative actions being taken on the basis of the MoU with the World Bank						
The MINEE to ensure key staff positions for the program are held by qualified staff and experienced staff	Fiduciary Systems		MINEE	Recurrent	Yearly	PIU staff performance evaluation report
The MINEE to use standard procurement documents, manuals and guides developed with World Bank support under the Public Expenditure and Statistical System Efficiency Project (PEPS) during implementation of the PforR	Fiduciary Systems		MINEE	Recurrent	Continuous	Agreed standard document
MINEE to dematerialize all public procurement management procedures; use COLEPS Phase 1 (planning through to reception of bids) for the implementation of the PforR. And the other two phases once finalized and approved by the Government	Fiduciary Systems		MINEE	Recurrent	Continuous	Procurement review
Annual screening of subprojects submitted by MINEE	Environmental and Social Systems	DLI 5	IVA	Other	At the beginning of each calendar year	Report
ARSEL submits ToR of PSIA to the	Environmental and Social	DLI 1	ARSEL	Other	Thirty (30) days after	Terms of reference



World Bank for approval.	Systems				the Effective Date	
ARSEL conducts a poverty and social impact analysis (PSIA) of electricity tariffs	Environmental and Social Systems	DLI 1	ARSEL	Other	Six (6) months after the Effective Date	Report
MINEE will put in place an E&S Taskforce with qualified E&S specialists & an adequate annual budget. The MINEE E&S Taskforce will cover all infrastructure projects piloted by the MINEE beyond the PforR and strengthen capacity building in Ministry	Environmental and Social Systems		MINEE	Other	Thirty (30) days after the Effective Date.	Resolution
The Recipient shall cause each of PforR's PCU and SONATREL, to designate and maintain throughout Program implementation an environmental and a social specialist as further detailed in the ESMS and the POM	Environmental and Social Systems		All PIU	Other	Within thirty (30) days after the Effective Date	Resolution
MINEE prepares an Environmental and Social Management System (ESMS) as per validated terms of reference by the World Bank	Environmental and Social Systems		MINEE	Other	Thirty (30) days after the Effective Date and in any case not before the start of works	Report
MINEE prepares a completion report of livelihoods restoration actions recommended under the ESMS	Environmental and Social Systems	DLI 5	MINEE	Other	Before the start of associated works	Report



The IVA will verify the compliance with the livelihood's restoration chapter of the ESMS	Environmental and Social Systems	DLI 5	VA	Other	Before the start of associated works	Report
MINEE prepares a communication plan	Environmental and Social Systems		MINEE	Other	120 days after the Effective Date	Report
MV customers satisfaction survey	Environmental and Social Systems	DLI 1	ARSEL	Due Date	31-Dec-2025	Report



ANNEX 7. IMPLEMENTATION SUPPORT PLAN

1. Substantial inputs will be required by the World Bank to support implementation of the Program by the GoC for several reasons: (a) as the first PforR in the electricity sector and the first PforR for Cameroon in any sector, there will be a significant learning curve for both the GoC and World Bank; (b) a largely centralized implementation structure at MINEE involves high levels of coordination with the MINFI and four sector agencies (SONATREL, AER, ARSEL, and ENEO); (c) a variety of activities across segments (transmission, distribution, and tariff regulation) will need to be carried out simultaneously with efforts to strengthen sector planning, procurement, and contract management; (d) modification/strengthening of the Program performance verification procedures given that the loan disbursement will be based on DLIs; and (e) the PIU will be created for implementation support and assessment of outcomes.

- 2. Specifically, the World Bank’s implementation support will be needed in the following areas: (a) Technical. The World Bank has reviewed the Program systems related to planning of the renewable energy, transmission and distribution activities, efficient operation of facilities, and provision of quality services. The identified areas for improvement have been agreed with MINEE and incorporated in the PAP or used as DLIs. MINEE will require continued World Bank inputs and advice during the introduction of new systems, tools, and techniques. (b) Procurement. The World Bank’s procurement team has carried out an extensive review of MINEE’s systems for procurement and contract arrangement and has recommended a number of actions. During implementation, substantial focus will be needed to support implementation of the roadmap for increased transparency in procurement and contract management, implementation of new Procurement Regulations, staff training, and certification arrangements. (c) FM support will focus on advising MINEE on improvements to budget monitoring, control, and financial reporting. Attention will also be needed on operation of internal audit. The adequacy of MINEE’s resources to cover its share of the Program costs will be a recurrent theme for which the World Bank’s support will be needed. (d) Environmental and social. The environmental and social team will focus on ensuring that MINEE’s guidelines and standards on environmental and social screening are applied in the selection of activities. In addition, the World Bank will help ensure that capacity to manage environmental and social matters is maintained through training and other activities.

3. Support plan. The majority of the World Bank team will be based in Cameroon as is the case during Program preparation. A limited number of experts will participate to bring in specialized and international experience. Table 7.1 shows the input requirements.

Table 7.1. Task Team Skills Mix Requirements for Implementation Support

Table with 4 columns: Skills Needed, Number of Staff Weeks, Number of Trips, and Comments. Rows include Team leader, Co-team leader, Energy specialist, Transmission engineer, Financial analyst, Economist, and Environmental specialist.



Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Social development specialist	8	0	Country-based
Procurement specialist	8	0	Country-based
Financial management specialist	8	0	Country-based
Operations officer	8	1	HQ
Gender specialist	8	4	HQ

Note: HQ = Headquarters.



ANNEX 8. INVESTMENT PROJECT FINANCING COMPONENT

1. **The PforR includes an IPF component of US\$20 million to support implementation of the program and capacity building of the sector agencies with key roles in the execution of activities supported by the PforR.** It will fund these activities following the World Bank's procedures for procurement and fiduciary management as well environmental and social framework:
 - (a) Creation of a PIU that will provide overall coordination support for the implementation of the PfoR activities and as the secretariat of the Inter-ministerial Committee.
 - (b) Services of the IVA that will conduct verification of the achievement of DLIs and manage the verification process.
 - (c) Services of an owner's engineer who will be recruited to support the implementing agencies in the preparation of technical bidding documents and supervision of works under the infrastructure investments in distribution (access), transmission, and generation (installation of solar PVs).
 - (d) Technical assistance to MINEE, CELCOR/MINEE, CoA, ARSEL, SONATREL, AER, and EDC such as consultancy services for the preparation of planning documents for the sector including an Electrification Master Plan, and Least-Cost Generation, Transmission and Distribution Expansion Plan. Technical and feasibility studies necessary for the implementation of reform actions will also be supported by the IPF.
 - (e) Creation of an Internship program to enhance technical skills in the electricity sector with a focus on women, and preparation of a study to inform a gender strategy for the electricity sector.
 - (f) Construction of a Center of Excellence and installation of technical laboratory equipment inside the perimeter of the existing campus of the University of Ngaoundéré for the development of technical competences in the electricity sector.
 - (g) Other consultant services, goods, trainings, workshops, non-consultant services, and incremental operating costs related to capacity building and implementation support.
2. **Technical assistance provided to the regulator ARSEL will focus on strengthening its capacities to carry out its regulatory duties.** The IPF component will finance the consultancy services that will commission the integrated regulatory information system (monitoring database), which has been designed using funds from SONATREL's ETRP (P152755). It will also finance the commissioning and regular update of a database with international and regional benchmark prices of electricity materials and components. Lastly, an engineering firm will support ARSEL in drafting a report on an updated physical inventory of assets in ENEO's concession.
3. **For MINEE, technical assistance will aim at strengthening its capacity to oversee planning in the sector and increase the efficiency of investment funding from public and private sources of funds.** The IPF component will fund MINEE's preparation of (a) an Electrification Master Plan and (b) a Generation, Transmission, and Distribution Master Plan, including a demand forecast assessment and a mechanism of successive updates.
4. **For SONATREL and EDC, the IPF component will fund the identified needs for capacity building,** including the participation of the agencies' staff in technical field visits and professional conferences abroad to learn about state-of-the-art issues that can contribute to accelerating investment plan implementation.



5. **The PIU will be lodged within MINEE**, which chairs the ITC and will comprise initially of a program coordinator, deputy program coordinator in charge of monitoring and evaluation, a procurement specialist, a financial management specialist, an environmental specialist, a social development specialist and a program assistant. Technical specialists will provide support to the PIU. Staffing needs will be reassessed once implementation starts and adjusted, as necessary. The PIU will carry out the following functions:

- (a) Conduct the daily monitoring and coordination of the Program implementation between the various actors including MINFI (Budget and Treasury Departments), MINEE, SONATREL and ARSEL. It will also ensure regular communication with the Prime Minister's office and Presidency.
- (b) Coordinate regular meetings of the Inter-ministerial Committee and provide administrative and implementation support to the ITC.
- (c) Monitor and evaluate progress made in achievement of the DLIs through the collection of data and facilitation of coordination between MINEE and MINFI.
- (d) Coordinate preparation of bidding documents with other implementing agencies to be submitted to the Special Procurement Commission with the support of the owner's engineer.
- (e) Engage an IVA to conduct the verification of DLI achievements and manage the verification process.
- (f) Support the recruitment of consultants and organization of workshops.
- (g) Maintain records for procurement activities and expenditures incurred and ensure timely preparation and submission of required financial reports.

Financial Management Arrangements

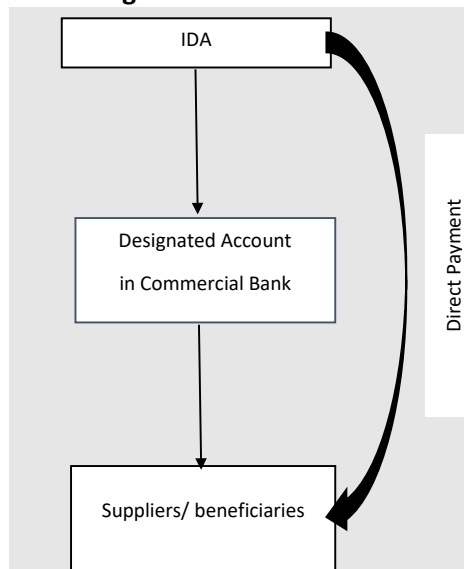
6. **An FM assessment was undertaken to evaluate the adequacy of the project FM arrangements for the IPF component.** The objective of this assessment was to determine whether the project implementing agency has acceptable FM arrangements for implementation of the project. The project will be implemented by a new PIU to be established under the overall coordination of MINEE. Although the PIU is new, MINEE has experience in coordinating World Bank-financed projects: the Hydropower Development on the Sanaga River Technical Assistance Project (P157733), Rural Electricity Access Project for Underserved Regions (P163881), ETRP (P152755), and Cameroon-Chad Power Interconnection Project (P168185). The overall FM residual risk was considered Substantial. The proposed FM risk mitigation measures are considered adequate. An FM action plan has been proposed. Subject to the successful completion of the actions recommended in the action plan to address the risks identified, the proposed FM arrangements are considered acceptable to the World Bank.

7. **Planning and budgeting.** The program coordinator will gather inputs from the Inter-ministerial Committee and the key agencies to be supported under the IPF component to prepare an AWPB for this component. This workplan and budget will be submitted to the World Bank at least two months before the beginning of each fiscal year. For the first year of implementation, the workplan and budget should be prepared before effectiveness. A budget execution report will be included in the quarterly IFR to enable monitoring of project implementation. For SONATREL and EDC, the IPF component will fund the identified needs for capacity building including the participation of the agencies' staff in technical field visits and professional conferences abroad to learn about state-of-the-art issues that can contribute to accelerating investment plan implementation.



8. **Funds flow and disbursement arrangements.** Funds flow will rely on the Government’s banking arrangements through the CAA. CAA’s Managing Director will continue to act as the public accountant, which includes the signing authorization on all payments using the automated payments module of CAA information system for donor financing. The World Bank will disburse funds for the IPF component to the DA denominated in XAF and opened at a commercial bank. A sub-account could be considered and managed by the PIU. The DA will be managed according to the disbursement procedures described in the administrative, accounting, and financial procedures manual as part of the POM and the Disbursement Letter. Report-based disbursement will apply, and the DA will receive an initial deposit equivalent to six months’ expenditures forecast and will be replenished regularly through the IFR.

Figure 8.1. Funds Flow - IPF



9. **Accounting policies and procedures.** The PIU has the responsibility for the accounting and financial reporting of the IPF component. The current OHADA accounting standards (SYSCOHADA) in use in West and Central African Francophone countries will be used. The project’s accounts will be maintained on an accrual basis, supported by appropriate records and procedures to track commitments and safeguard assets. The annual financial statements will be prepared by the PIU, in accordance with the SYSCOHADA and World Bank’s requirements.

10. **Reporting.** The FM team of the PIU will be required to prepare an IFR on a quarterly basis. The IFR will include (a) sources and use of funds; (b) use of funds per activity; (c) dedicated and DA’s activities’ statement; and (d) use of funds according to procurement methods and thresholds. The format and content of the IFRs as agreed with the Borrower and the World Bank. The IFR reports will be submitted to the World Bank 45 days after the end of the quarter to which they related.

11. **Internal controls.** The standardized Financial Management Manual of Procedures developed by CAA with the World Bank’s support will be adapted for the project and applied. In addition, the POM will include the administrative, financial, and accounting procedures. The manual will include a clear description of the initiation and approval processes with regard to the segregation of duties. The FM specialist will be responsible for maintaining all necessary controls to ensure that (a) the project funds are



used only for the intended purposes in an efficient and economical manner and (b) periodic financial reports are prepared in an accurate, reliable, and timely manner.

12. **External audit.** The audit of the IPF and the PforR be carried out by the CoA. The CoA has a MoU with the AfDB to audit 11 AfDB-financed investment lending projects. two reports were reviewed during the assessment and the CoA agreed to carry out the audit of the Program and the IPF. The ToR of the audit will be agreed between the PIU, the World Bank and the CoA. The annual audited financial statements of the IPF component together with a Management Letter shall be submitted to the World Bank within six months of the end of the fiscal year. Provisions will be made in the project to support the COA to deliver quality report and on time.

13. **FM implementation support plan.** FM implementation support will be consistent with a risk-based approach. The implementation support intensity is based initially on the FM risk rating, and subsequently on the updated FM risk rating during implementation. The FM risk for this Program is rated Substantial.

Table 8.1. FM Action Plan

Action	Responsible Entity	Deadline and Conditionality
Appoint an FM specialist and one accountant within the PIU.	MINEE	No later than two months after the effectiveness date
Develop the POM.	MINEE	Before the effectiveness date

Procurement Arrangements

14. **Procurement activities by the PIU will be carried out in partnership with the relevant agency being supported.** The objective, scope, and technical content for each of the procurement activities being conducted for the benefit of other agencies will be prepared by the sector agency. Each agency will take the lead in the preparation of the ToRs relating to its activities, technical evaluation, and contract management of such activities. Procurement under the IPF component will be carried out in accordance with the following World Bank procedures (a) the World Bank Procurement Regulations for IPF Borrowers (November 2020 edition) (Procurement Regulations) and (b) ‘Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants’, dated October 15, 2006, and revised in January 2011 and as of July 1, 2016, and other provisions stipulated in the Financing Agreements. In accordance with paragraph 5.9 of the World Bank Procurement Regulations, the World Bank’s Systematic Tracking and Exchanges in Procurement (STEP) tool will be used to prepare, clear, and update Procurement Plans and conduct all procurement transactions for the IPF component.

15. **Procurement of works and substantive procurement of goods are not envisaged under the Program.** There may, however, be some procurement of office equipment and computers. Procurement of goods will be carried out using the World Bank’s Standard Procurement Documents for all procurement, subject to open competition (if any). Readily available off-the-shelf goods that cannot be grouped or standard specification commodities for individual contracts of less than US\$100,000 equivalent may be procured under Request for Quotation (RFQ) procedures as detailed in paragraph 6.7 of the Procurement Regulations and the ‘Guidance on Shopping Memorandum’ issued by the World Bank on June 9, 2000. Procurement of vehicles, estimated to cost up to US\$500,000 equivalent, can also be undertaken under the same RFQ procedures, provided they are procured directly from manufacturers or reputable first-line



vehicle dealers. The appropriate selection method for each procurement of goods contract is set out in the finalized Procurement Plan.

16. For consultancy services that will be provided to the agencies, consultancy firms and individuals will be selected from short lists compiled after the PIU has solicited a request for expressions of interest, using the World Bank's Standard Request for Proposals, where required by the World Bank's Procurement Regulations. National selection through advertisement in the national media/press may be used when the nature, scope, and/or value of the consulting services is unlikely to attract foreign competition and there are adequate qualified national consultants to carry out the assignments, in accordance with the provisions of paragraph 7.25 of the Procurement Regulations. The appropriate selection method for each consulting contract is set out in the Procurement Plan.

17. **IPF Project Procurement Strategy for Development summary.** The two major categories of procurement under this project are consultancies and procurement of information systems as per finalized Project Procurement Strategy for Development. There are several market players for the consulting services both nationally and internationally. The packages will be attractive to the market players except the ones with low values, which however will be attractive to local market players. The information system would most likely be provided by international players or local players that are partners to international players. Nevertheless, there is enough competition in the market to achieve value for money. The major risk for the project is the risk associated with the capacity of the PIU, which will be mitigated by the assistance provided by procurement specialists available at MINEE, the sector agencies, and World Bank country office. In addition, there is the risk of the coordination of the procurement implementation by the PIU with the other sector agencies. To mitigate this risk, each agency participating in the Program will nominate a focal person who will participate at the regular program coordination meeting to be led by the PIU.



ANNEX 9. GENDER

1. Although Cameroon has made strides to increase gender equality and empowerment, for example, through the adoption of the Gender National Policy, as well as the Convention on the Elimination of All Forms of Discrimination Against Women setting out, among other things, to promote equal access to education and equal opportunities in economic and employment sectors, notable gaps remain, for example, in labor force participation. Specifically for the energy sector, there is an indication that employment for women follows the global trends and women are underrepresented in Cameroon.

2. Widely regarded as one of the least gender diverse parts of the economy, women in the energy sector account for only 22 percent of the labor force in the oil and gas sector and 32 percent in renewables and representation in utilities is low for women in all roles (3–25 percent). Examples from other regions show that women tend to work in the middle- to lower-level nontechnical (that is, administrative) positions with the percentage even lower for women in technical roles (0.1–21.0 percent). Low female enrollment in engineering (0.5–31.0 percent) contributes to the small pool of qualified job candidates and evidence points to multifaceted issues around building a pipeline of women in STEM from primary to secondary schooling.

3. In addition to the benefits of opening the energy sector to women, there is mounting evidence that demonstrate women’s value in the workforce in terms of various metrics of an organization’s or firm’s performance. For example, firms with more women in leadership roles often demonstrate better firm performance, especially during periods of economic volatility, as well as greater ability to minimize high-risk transactions and serve women-dominated markets. Diversity is also regarded to be vital for driving more innovative and inclusive solutions for energy transitions all over the world.

4. A baseline of data concerning gender issues has been established following the completion of questionnaires received from ARSEL, AER, MINEE, and SONATREL. Although some progressive measures were noted (dedicated units and focal points and possibility for flexible work options at ARSEL, established partnership with universities for recruitment at SONATREL, and so on) several notable gaps were highlighted across the sector such as

- (a) The existence of barriers for women’s employment in the energy sector including a general lack of dedicated policies for recruitment and employment, lack of flexible working arrangements as well as specific infrastructure, and so on;
- (b) Lack of established pathways to career advancement in the sector (dedicated trainings, mentoring, and so on); and
- (c) A weak pipeline of technical female staff joining energy sector institutions.

5. Moreover, the data show that the percentage of women employed at these institutions is in line with the abovementioned national-level data (see Table 9.1), with particularly low percentages noted in technical positions.

Table 9.1. Percentage of Women Employed in Key Energy Sector Institutions

Institution	Percentage (%) of Women in		
	Total Staff	Management	Technical Positions
SONATREL	28	10	4
ARSEL	35	33	23



Institution	Percentage (%) of Women in		
	Total Staff	Management	Technical Positions
MINEE	30	23	10
AER	19	16	5

6. A set of actions could be envisaged to narrow the identified gaps to promote women’s employment in the sector (Table 9.2). To better target potential actions, an analysis was undertaken to assess the current practices. With regard to the internships currently conducted by institutions, it has been established that they are mainly academic, sometimes professional or even so-called ‘summer’ internships. Usually, they are unpaid and have a duration of one to six months. The reception capacity is relatively large, with several dozen trainees per year per institution and fairly balanced for the proportion of men and women in general. Exceptions are the so-called ‘technical’ internships where there is a lower proportion of women (15–25 percent). Internship admission procedures are often not formalized, with unsolicited applications as the usual entry point. Recruitment thereafter remains rare, often due to constraints related to recruitment policies/rules, the need for Board approval, or other factors. It is nevertheless clear that internships considerably increase the chances of finding a job in the sector later on but that without targeted assistance, the recruits in the sector remain quite low at 5 percent, in the year following the internship.

Table 9.2. Identified Gaps and Potential Actions and Their Proposed Indicators

Identified Gap ⁷⁶	Potential Actions	Proposed Indicator ⁷⁷
Barriers for women to be employed in the energy sector	<ul style="list-style-type: none"> (a) Further assessment of barriers for women to being hired and employed in the energy sector (hiring practices, workplace policies, career opportunities, work environment, school-to-work transition, and so on) through questionnaires and key informant interviews (b) Consultations and/or trainings on gender equality measures and practices for management/staff of key institutions (MINEE, AER, ARSEL, SONATREL, and so on), including HR focal points 	<ul style="list-style-type: none"> <i>(a) The existence of gender strategies, measures, and/or policies in place</i> <i>(b) Number of staff trained</i>
Low number of women engineers/staff/in technical positions and limited promotion opportunities for women in the sector	<ul style="list-style-type: none"> (a) Internship program to increase percentage of women in technical internships (b) Training and mentorship opportunities for female staff to boost recruitment and internal promotion (c) Reserved places for female staff in trainings (also if offered under the project) to encourage career advancement. 	<ul style="list-style-type: none"> (a) Women interns in technical internships (Percentage) Baseline: 15% Target: 30% (b) Women accessing energy sector jobs/promotion following internship (Percentage) Baseline: 5% Target: 20% <i>(c) Number of women benefitting from trainings</i>

⁷⁶ Presumed or confirmed.

⁷⁷ Indicators in italics featuring only in the POM.



Identified Gap ⁷⁶	Potential Actions	Proposed Indicator ⁷⁷
Weak pipeline of technical female staff joining energy sector institutions	(a) Outreach activities to universities and career fairs including promotional campaigns to enhance the interest and awareness on energy sector employment, and to inform about internship opportunities	(a) <i>Number of outreach activities</i>

7. Through the IPF component, the project will support an internship scheme with a specific target for women, to benefit from work experience, particularly in technical positions across the different institutions of Cameroon’s energy sector. With the aim to support a more strategic approach toward channeling female STEM talent into the energy sector, a targeted internship program will be put in place for 100 beneficiaries for the duration of the Program at 25 beneficiaries per year. The proposed approach aims to alleviate the existing challenges and bottlenecks in internships identified during a thorough assessment at key institutions.

8. Interns will be therefore competitively selected among STEM students and recent graduates based on institutional needs, remunerated for the duration of their six-month internships and benefit from additional training and mentoring to maximize their chances to join the energy sector workforce once their internship is completed (see Table 9.3). In addition, current employees will also have an opportunity to undertake development assignments in the form of internships at about 15–20 percent of available placements. The operation will target increasing the percentage of women to 30 percent in technical internships up from the current 15 percent and increasing their chances of subsequently accessing energy sector jobs/promotions with a 20 percent target at four times its current baseline. This activity will be undertaken in close collaboration with selected institutions of higher learning, the sector institutions that could potentially hire successful interns, and SYFEE.

Table 9.3. Overview of Internship program for enhancing women’s technical skills in energy sector

	Recommendations
Host institution	SONATREL, AER, EDC, MINEE, ARSEL
Number of interns	25 interns per year for the duration of the project (approximately 100 in total)
Internship type	<ul style="list-style-type: none"> Primarily professional (‘pre-employment’ internships) for STEM degree holders but adapted to actual institutional needs Approximately 15–20 percent of the internships could be awarded to employees for career development Remunerated
Duration	Three months, renewable once (at the same institution or another one, if available)
Selection procedure	Centralized but according to actual institutional needs
Coordination	MINEE, possibly with external assistance (for example, SYFEE)
Added value	<ul style="list-style-type: none"> Adaptability based on institutional needs and capacities and possibility to iterate each year as based on prior experiences Publicity around the internship opportunities to increase the visibility of participating entities as potential employers in the sector and thereby attract more female talent Constitution of a talent pool and alumni network for future recruitment facilities

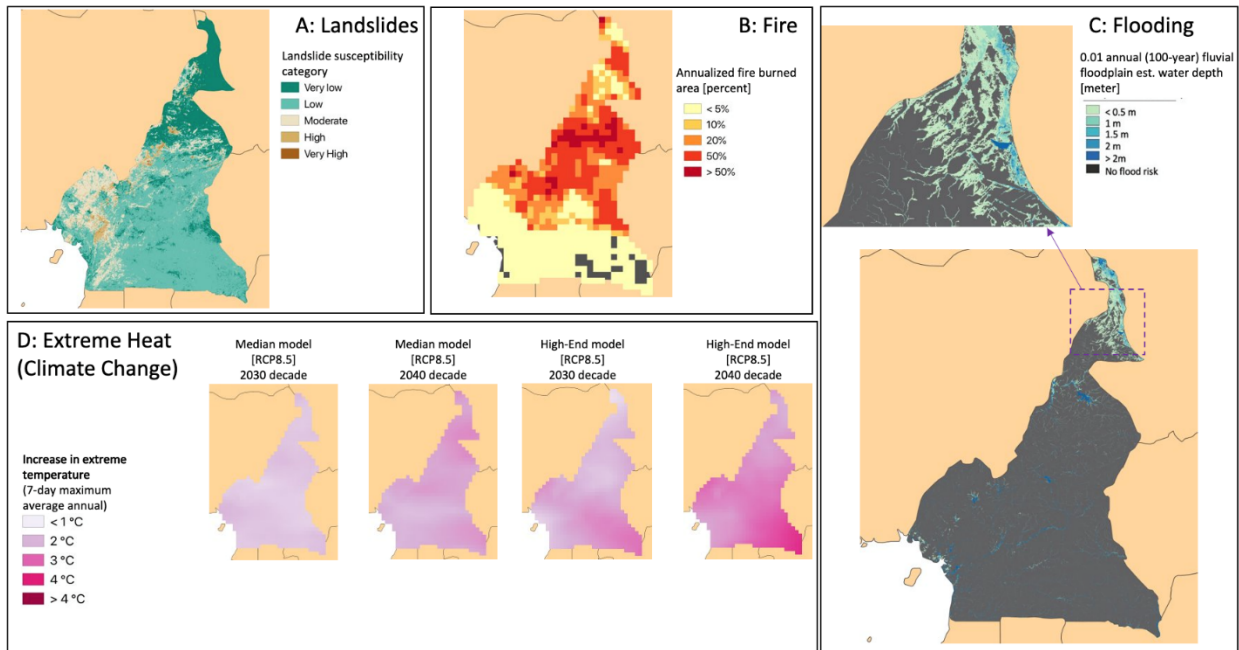


ANNEX 10. CLIMATE AND HAZARD CONSIDERATIONS

Climate Change and Natural Hazard Risks and Adaptation Opportunities

1. Resilient infrastructure development in Cameroon includes consideration of existing natural hazards⁷⁸ and ongoing climate change. Four key risks in this operation include wildfire, flooding, landslides, and extreme heat, which is expected to increase due to climate change^{79,80,81}. These are shown geospatially in Figure 10.1.

Figure 10.1: Key hazard risks in Cameroon and the geographic distribution



A: Landslides susceptibility, obtained from data on slopes, geology, faults, forest loss, etc. (30 arcsecond grid, approximately 1km x 1km). B: Wildfire Risk, calculated as the annualized fire impact in each region, based on 25-year historical average. Value is total percent of land area (0.25° grid, approximately 25km x 25 km) burned each year based upon all available data for 1997-2015. C: Flooding Risk, shown as the estimated depth of water from the 0.01 annual probability historical flood event (“100-year event”) for fluvial (river) flooding. Zoomed in region shows geography in the Extreme North Region. D: Extreme heat increases from climate change through the 2030 and 2040 decades, shown for the median (50th percentile) and high-end (95th percentile) climate models. Values are the average annual increase, in degrees Celsius, of the hottest week of the year.

2. Wildfire is recognized as a ‘high’ risk in Cameroon⁸² under current climate conditions, and climate change is expected to exacerbate this risk⁸³. However, this risk is concentrated in the northern part of the

⁷⁸ ThinkHazard database, Chad. The World Bank (2021). <https://www.thinkhazard.org>.

⁷⁹ Yaro, J, J Hesselberg, Editors, Adaptation to Climate Change and Variability in Rural West Africa, Springer, 2016

⁸⁰ Hirabayashi et al, Global flood risk under climate change, Nature Climate Change, 3, 816-821, 2013

⁸¹ 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>.

⁸² ThinkHazard database, Chad. The World Bank (2021). <https://www.thinkhazard.org>.

⁸³ 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>.



country, particularly in the Adamawa and North regions. Here, satellite imaging shows that 50 percent of image pixels register wildfire, Figure 10.1.B. These data are calculated based upon an annualized average from an historical 25-year period⁸⁴. Over a 30-year period, however, even a 5 percent annual risk translates to a 78 percent chance that at least one fire event will occur in these areas. This rate indicates that adaptation options are beneficial over the lifecycle in all regions where fire exceeds a 5 percent annual likelihood. For example, where existing LV and MV lines will be considered, a fire-retardant application to all wood poles reduces wildfire damages. For normal conductor lines in these regions, using steel poles is cost effective to reduce damages. Further, for the highest risk and/or most critical regions, consideration of aerial bundled cables reduces the need for vegetation management and damages resulting from fires, as well as the likelihood of causing a fire in high-risk regions.

3. Flooding is considered as ‘high’ risk for Cameroon¹, although the risk varies geographically and seasonally. Available information for the depth of water under an expected 0.01-annual flood probability (“100-year flood”)⁸⁵ is shown in Figure 10.1. This means that there is a 1 percent chance in any given year of a flood occurring at the depths shown in the legend. In a 30-year project timeframe, this amounts to a 26 percent likelihood of occurring at least once. It should be noted that the data presented in Figure 1 is based on historical occurrences, which is limited both by the available historical record. Climate change models show that along the Sahel and Central Africa regions, the current 0.01-annual probability flood event could increase in frequency to a 0.015-0.2-annual probability event or greater (the historical “100-year” event may become as frequent as a “50-75 year” event), although the models vary⁸⁶.

4. The risk for ‘extreme heat’ in current climate conditions is rated as ‘high’ in Cameroon¹. Extreme heat has impacts on energy demand (cooling for buildings), transmission and distribution efficiency, transformer life, and potential increases to other hazards already a concern in the region, including wildfire risk. During the coming decades, climate change is projected to further exacerbate extreme temperatures throughout the country. Figure 10.1 shows the increased annual seven-day maximum average temperature for each decade, relative to the historical values. Values are presented in degrees Celsius⁸⁷ for the 2030 and 2040 decades for a median (50th percentile) and higher-end (95th percentile) climate model. In most locations, the increase in maximum temperatures over a seven-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 increases of 2-4°C. By 2040, the East region of the country sees increases of close to 4°C. Extreme heat reduces the efficiency of photovoltaic panels between 0.3-0.5 percent per increase in degrees Celsius above the standard operating temperature of 25 degrees Celsius.⁸⁸ For transmission and distribution infrastructure operating at full capacity, increases in ambient temperature reduce the efficiency of transmission.

⁸⁴ Giglio, L., Randerson, J., & Van der Werf, G. (2013). Analysis of daily, monthly, and annual burned area using the fourth-generation global fire emissions database (GFED4). *Journal of Geophysical Research: Biogeosciences*, 118(1), 317–328.

⁸⁵ FATHOM Flooding Data [Fluvial]. The World Bank Group (2021)

⁸⁶ Hirabayashi et al, Global flood risk under climate change, *Nature Climate Change*, 3, 816-821, 2013

⁸⁷ Decadal values represent the average of the annual 7-day maximum average temperature for each year within the corresponding decade. The 2030 decade represents the average value for the years 2030-2039, for example. Values are the increase, in degrees Celsius, above the 30-year historical baseline (calculated as the average of annual 7-day maximum temperatures from 1970-1999). Calculations completed by the authors, based on data from NASA Center for Climate Simulation, NASA NEX-GDDP (2019)

⁸⁸ 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



Operation Resilience Considerations

5. Successful implementation of this project will strengthen the country's energy sector through access to more reliable and higher quality services, better financial sustainability in the energy sector, strengthen institutional framework in the energy sector.

Resilience 'of' Operation Considerations

6. While the operation does not make direct investments to support large-scale generation and new transmission infrastructure, it addresses sector fundamentals, which will have a positive effect in expanding generation capacity and building transmission infrastructure in the future. In future projects and operations this will help enable: (a) consideration of siting and methods to avoid hazard impacts or hardening to reduce damage (e.g., elevation of assets or construction of berms to avoid flooding⁸⁹, and (b) use of steel or concrete poles for transmission to reduce the impacts of cyclones on transmission lines⁹⁰).

Resilience 'Through' Operation Considerations

7. A primary benefit of this operation is the increased resilience of communities, households and institutions that come through increased access to electricity and the systems and management structures that enable it. Increasing energy access is also central to economic development which itself has direct ties to increased resilience.

⁸⁹ 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

⁹⁰ PG&E. 2019. "PG&E 2019 Draft Per Unit Cost Guide." California ISO. www.caiso.com/Documents/PG-E2019DraftPerUnitCostGuide.xlsx