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Report No: PAD4224

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF SDR 106.5 MILLION
(US$150 MILLION EQUIVALENT)

TO THE

FEDERAL REPUBLIC OF SOMALIA

FOR THE

SOMALI ELECTRICITY SECTOR RECOVERY PROJECT

November 15, 2021

Energy and Extractives Global Practice
Eastern and Southern Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective {September 30, 2021})

Currency Unit =	US$
US$1 =	SDR 0.71
SDR 1 =	US$1.41

FISCAL YEAR
July 1 - June 30

Regional Vice President:	Hafez M. H. Ghanem
Country Director:	Keith E. Hansen
Acting Regional Director:	Ashish Khanna
Practice Manager:	Erik Magnus Fenstrom
Task Team Leader(s):	Patrick Thaddayos Balla, Paul Baringanire, Chiara Odetta Rogate

ABBREVIATIONS AND ACRONYMS

BAU	Business as Usual
BESS	Battery Energy Storage Systems
BOQ	Bill of Quantities
BSSF	Business Services Support Firm
CCS	Corporate Communication Strategy
CERC	Contingent Emergency Response Component
CMU	Country Management Unit
CPF	Country Partnership Framework
CRI	Corporate Result Indicator
DA	Designated Account
DSI	Design Supply Installation
E&S	Environmental and Social
EAFS	External Assistance Fiduciary Section
EAPP	Eastern Africa Power Pool
ENEE	*Ente Nazionale Energia Elettricaia* (Somalia National Electric Corporation)
EPC	Engineering Procurement and Construction
ERR	Economic Rate of Return
ESF	Environmental and Social Framework
ESI	Electricity Supply Industry
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESRS	Environmental and Social Review Summary
ESCP	Environmental and Social Commitment Plan
ESP	Energy Services Provider
ESRES	Energy Security and Resource Efficiency in Somaliland
ESRC	Environmental and Social Risk Classification
ESSA	Environment and Social Standards Advisor
ESWG	Energy Sector Working Group
FCDO	Foreign, Commonwealth & Development Office
FCV	Fragility, Conflict and Violence
FGS	Federal Government of Somalia
FM	Financial Management
FMIS	Financial Management Information System
FMS	Federal Member States
FNTC	Federalization Negotiation Technical Committee
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GEEL	Growth, Employment, Enterprise and Livelihood
GER	Gross Enrollment Rate
GHG	Greenhouse Gas
GNI	Gross National Income
GoSL	Government of Somaliland
GRC	Grievance Redress Committee
GRS	Grievance Redress Service

HIPC	Highly Indebted Poor Country
HOAI	Horn of Africa Initiative
HOA RISES	Horn of Africa Regional Integration for Sustainable Energy Supply
HSDG	High Speed Diesel Generator
IA	Implementing Agency
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDP	Internally Displaced Persons
IFC	International Finance Corporation
IFI	International Financial Institutions
IFR	Interim Financial Reports
IPF	Investment Project Financing
IPSAS	International Public-Sector Accounting Standards
ISA	International Standards on Auditing
JMR	Joint Meter Reading
KfW	*Kreditanstalt fur Wiederaufbau (German Development Bank)*
LMP	Labor Management Procedures
LPG	Liquefied Petroleum Gas
LV	Low Voltage
M&E	Monitoring and Evaluation
MIS	Management Information System
MoEM	Ministry of Energy and Mines
MoEWR	Ministry of Energy and Water Resources
MoF	Ministry of Finance
MPA	Multi-Phase Programmatic Approach
MV	Medium Voltage
NAPA	National Adaptation Program of Action
NDC	Nationally Determined Contribution
NDP	National Development Plan
NGO	Nongovernmental Organization
NPF	New Procurement Framework
O&M	Operation and Maintenance
OE	Owner's Engineer
PAEM	Pan-Arab Electricity Market
PDO	Project Development Objective
PFM	Public Financial Management
PforR	Program for Results
POM	Project Operations Manual
PIU	Project Implementation Unit
PP	Procurement Plan
PrDO	Program Development Objective
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
PSMP	Power Sector Master Plan
PV	Photovoltaic
RPF	Resettlement Policy Framework
SAPP	Southern Africa Power Pool

SCoA	Standard Chart of Accounts
SDG	Sustainable Development Goal
SEAH	Sexual Exploitation Abuse and Harassment
SEAP	Somali Electricity Access Project
SEP	Stakeholder Engagement Plan
SESIA	Sectoral Environmental and Social Impact Assessment
SESRP	Somali Electricity Sector Recovery Project
SFMIS	Somalia Financial Management Information System
SHS	Solar Home Systems
SIDA	Swedish International Development Agency
SL	Somaliland
SLFMIS	Somaliland Financial Management Information Systems
SMF	Security Management Framework
SMP	Security Management Plan
SOE	Statements of Expenditures
SOP	Series of Projects
STEM	Science, Technology, Engineering and Mathematics
STEP	Systematic Tracking of Exchanges in Procurement
TA	Technical Assistance
ToR	Terms of Reference
UCS	Use of Country Systems
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WDR	World Development Report
WtP	Willingness to Pay

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Somalia	Somali Electricity Sector Recovery Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P173088	Investment Project Financing	High

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[✓] Series of Projects (SOP)	[✓] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[✓] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[✓] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
08-Dec-2021	31-Dec-2026
Bank/IFC Collaboration	Joint Level
Yes	Complementary or Interdependent project requiring active coordination

Proposed Development Objective(s)

The Project Development Objective is to increase access to lower cost and cleaner electricity supply in project areas and to reestablish the electricity supply industry.

Components

Component Name	Cost (US$, millions)

Component 1 –Subtransmission and distribution network reconstruction, reinforcement and operations efficiency in the major load centers of Mogadishu and Hargeisa	75.00
Component 2 –Hybridization and battery storage systems for minigrids	20.00
Component 3 – Stand-alone solar off-grid access to public institutions (health and education)	40.00
Component 4 -Institutional development and capacity building	15.00

Organizations

Borrower:	Federal Republic of Somalia
Implementing Agency:	Ministry of Energy and Minerals, Somaliland Federal Ministry of Energy and Water Resources (MoEWR) Ministry of Finance, Somaliland Ministry of Finance, Federal Republic of Somalia

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	150.00
Total Financing	150.00
of which IBRD/IDA	150.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	150.00
IDA Grant	150.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Somalia	0.00	150.00	0.00	150.00
National PBA	0.00	150.00	0.00	150.00

Total	**0.00**	**150.00**	**0.00**	**150.00**

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2021	2022	2023	2024	2025	2026	2027
Annual	0.00	2.00	12.50	34.60	61.90	39.00	0.00
Cumulative	0.00	2.00	14.50	49.10	111.00	150.00	150.00

INSTITUTIONAL DATA

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

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	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	High
8. Stakeholders	Moderate
9. Other	High
10. Overall	Substantial

COMPLIANCE

Policy

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

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

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	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	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
Section I.B.1(b) of Schedule 2 to the Financing Agreement:
FGS to maintain a PIU headed by a Project Manager/Coordinator assisted by multi-disciplinary and competent staff satisfactory to the Association

Sections and Description
Section I.B.1(d) of Schedule 2 to the Financing Agreement:
FGS to select and hire, by not later than three (3) months after the Effective Date, the services of a consulting firm acceptable to the Association in order to perform the functions of the owner's engineer

Sections and Description
Section I.B.1(e) of Schedule 2 to the Financing Agreement:
FGS to maintain throughout at least the initial period of one (1) year of implementation of its Respective Activities under the Project, the services of an environmental and social development consulting firm (the "E&S Consultant") acceptable to the Association, to carry out the environmental and social monitoring and supervision of the Project

Sections and Description
Section I.C.1 of Schedule 2 to the Financing Agreement:
FGS to prepare and adopt a Project Operations Manual (POM) in a manner and substance satisfactory to the Association and ensure that the Project is implemented in accordance therewith.

Sections and Description
Section I.D.1 of Schedule 2 to the Financing Agreement:
Prior to commencing any civils works for sub-project benefiting one or more ESPs the FGSto agree in writing with the respective ESPs the terms and conditions for the update of the ESP(s)' license and/or concession agreement(s)

Sections and Description
Section I.E.of Schedule 2 to the Financing Agreement:
The FGS shall select and hire, by no later than one (1) year after the Effective Date, the services of a consulting firm acceptable to the Association, to provide business support services to Beneficiary ESPs

Sections and Description
Section I.F.1 of Schedule 2 to the Financing Agreement:
FGS to prepare and furnish to the Association by no later than October 31st of each yearan annual work plan and budget in accordance with the POM

Conditions

Type	Financing source	Description
Effectiveness	IBRD/IDA	The Recipient has established and operationalized the PSC and the ESWG, in a manner and substance satisfactory to the Association

Type	Financing source	Description
Effectiveness	IBRD/IDA	The Recipient has prepared and formally adopted the Project Operation Manual for its Respective Activities under the Project in a manner and substance satisfactory to the Association, pursuant to Section I.C.1 of Schedule 2 to this Agreement
Type	Financing source	Description
Effectiveness	IBRD/IDA	The Recipient has selected and hired (and/or seconded from its own staff), to strengthen the capacity of the Project Implementation Unit, a security advisor with experience and qualification and under terms of reference satisfactory to the Association
Type	Financing source	Description
Effectiveness	IBRD/IDA	The Recipient has operationalized the grievance redress mechanism referred to in paragraph 6 of Section I.G in Schedule 2 of the Financing Agreement, in a manner and substance satisfactory to the Association
Type	Financing source	Description
Effectiveness	IBRD/IDA	The Recipient has prepared and adopted/approved a detailed capacity building plan covering the applicable ESSs pursuant to the provision of the ESCP, and in in a manner and substance satisfactory to the Association
Type	Financing source	Description
Disbursement	IBRD/IDA	No withdrawal shall be made: (a) for payments made prior to the Signature Date; (b) under Category (2) until and unless Somaliland has: (a) executed the Somaliland Subsidiary Agreement setting forth implementation arrangements for Somaliland's Respective Activities under the Project (including the flow of funds out of the Grant proceeds), and all Somaliland's internal requirements for the agreement to be binding upon Somaliland in accordance with its terms have been duly obtained/secured; (b) prepared and formally adopted a Project operation manual for its Respective Activities under the Project; and (c) established the institutional arrangements set forth in the forgoing manual, as shall be required to carrying out its Respective Activities under the Project, in a manner and substance satisfactory to the Association

I. STRATEGIC CONTEXT

A. Country Context

1. **Recovering from conflict, Somalia has been on a trajectory toward political stabilization and reconstruction**. In 2012, a provisional constitution was adopted, establishing a new Federal Government and seat of government in the city of Mogadishu. The 2012 Provisional Constitution established a federal political structure, including a parliament, the Federal Government of Somalia (FGS), and the Federal Member States (FMS)[1]. Although not internationally recognized, Somaliland has declared independence from Federal Government of Somalia (FGS) and does not participate in the federal system. Following this political transition, the international community agreed to the Somali Compact with the FGS, based on the New Deal, a guiding set of principles for peacebuilding and state building. The second elections were peacefully held in FGS in 2017 to establish the current administration. The sustained political, economic, and institutional reforms have enabled rebuilding core state capabilities. The FGS is currently going through election process for the upper and lower house before embarking on presidential elections.

2. **Somalia is facing severe development challenges**. The country has a population of about 15 million, of which roughly 60 percent are nomadic and semi-nomadic pastoralists, and 60 percent live in rural areas. About 70 percent of the population live below the poverty line (US$1.90 a day in 2011 purchasing power parity terms), although this figure is expected to have increased following a triple crisis of COVID-19, floods and locust's invasion. Approximately four out of ten Somali households are headed by a female and gender inequalities are severe.[2] Almost nine out of ten Somali households are deprived in at least one dimension of poverty—monetary, electricity, education, or water and sanitation[3]. The country's Gross Domestic Product (GDP) is about US$5 billion and GDP per capita is about US$333[4].

3. **The COVID-19 pandemic has interrupted Somalia's economic recovery**. The combined impacts of the COVID-19 pandemic together with devastating flooding and a new infestation of desert locust led to an economic contraction of an estimated 0.4 percent in 2020, compared with an initial growth forecast of 3.2 percent[5]. GDP growth is projected to rebound to 2.3 percent in 2021, based on encouraging performance in the first six months of the year. Bank deposits and credit to the private sector are on an upward trend. Export volumes have increased by nearly 30 percent, while total imports have grown by 12 percent[6]. Economic growth is projected to reach 3.0 percent in 2022 and 3.4 percent in 2023, returning to pre-pandemic levels over the medium term. This outlook depends on a continued national commitment to economic reform to reach the heavily indebted poor countries (HIPC) initiative completion point.

[1] The federal system includes five Federal Member States (FMS) – Galmudug, Hirshabelle, Jubbaland, Puntland and South West and the federally administered Banadir Administration.
[2] World Bank (2019) Somalia Poverty and Vulnerability Assessment, Washington DC.
[3] World Bank (2019) Somalia Poverty and Vulnerability Assessment, Washington DC
[4] Somalia Economic Update, World Bank, June 2021 (Edition No. 6).
[5] Ibid.
[6] Ibid.

4. **The triple crisis of COVID-19, floods and the desert locust infestation have adversely affected firms and households**. High frequency phone surveys have been deployed to gauge the impact of the crisis in Somalia[7]. Information available at the start of 2021 suggests that 85 percent of households reported reductions in sources of income, which has contributed to a rise in food insecurity. However, increases in the inflows of remittances throughout 2021 suggests that private household consumption may be improving. At the firm level, there have been closures and job losses. An estimated two-thirds of firms suspended operations between February 2020 to January 2021. Firms have adjusted to the crisis by making changes to production, and ways of delivering goods and services. However, most firms expect to return to their normal levels of sales and workforce. This positive outlook is reinforced by an expected roll-out of vaccinations to protect the population against COVID-19, where an estimated 90 percent of Somalis expressed interest in receiving testing and vaccines if provided without cost.

5. **Electricity access rates are low, and the cost of power is among the highest in the world**. The electricity access rate is estimated at 35 percent nationally[8], meaning that around 9 million Somalis lack access to electricity services. A disparity remains between access rates in urban areas (approximately 60 percent), rural areas (15 percent) and nomadic households (1 percent) in addition to high tariffs and connection fees which are barriers to access expansion. It is also a pre-requisite input for the provision of adequate health and education services, which is often not sufficient in urban areas and completely absent in rural ones, impeding resilience to the pandemic, future shocks, and the overall human development of the country. The World Bank's flagship report on Regulatory Indicators for Sustainable Energy (RISE, 2020) found that Somalia ranks in the upper 5 percent globally for power cost, and in the upper 15 percent globally for power expenditure as a share of gross national income (GNI) per household.

6. **The livelihoods of roughly half of Somalia's population are reliant on pastoralism or agro-pastoralist**. Since 2019 the country has experienced devastating floods and drought, as well as locusts, which have left about 5.2 million people in need of assistance and at risk of food insecurity. In addition, while Somalia has very low greenhouse gas emissions, it is ranked 181 out of 188 countries in terms of its vulnerability to climate change impact[9]. Somalia's extremely weak health system further exacerbates the country's vulnerability against natural disasters.

7. **In March 2020, Somalia qualified for debt relief through the Heavily Indebted Poor Countries (HIPC) Initiative, a major milestone that allows resource flows from international financial institutions (IFIs)**. Reducing the debt-to-GDP ratio from 111 percent in 2018 to 84 percent in 2020 reopens access to regular concessional resources from the International Development Association (IDA) and other IFIs, together with investment of private capital from the International Finance Corporation (IFC). Sustaining a positive trajectory will require predictable financing and improved institutions (among other factors) as numerous challenges prevail, such as weak government capacity, asymmetric federal structures, security concerns, human capital deficits, and low levels of state legitimacy.

B. Sectoral and Institutional Context

The energy sector is beset with intertwined challenges emerging from years of conflict, ad-hoc service provision, and lack of overarching regulations.

[7] World Bank (2021) Coronavirus and the private sector in Somalia: Results from Wave 2 of COVID-19 focused Enterprise Survey, Washington DC.
[8] Tracking SDG 7 (2021), The Energy Progress Report, Washington DC.
[9] Notre Dame Global Adaptation Initiative Country Index https://gain.nd.edu/our-work/country-index/rankings/

8. **The conflict destroyed public electricity infrastructure in Somalia**. Pre-conflict, the Somalia National Electric Corporation (ENEE) was the single public utility in operation, supplying Mogadishu and the main regional centers of Hargeisa, Berbera, Burao, Baidoa, and Kismayo through distributed diesel generators and localized distribution grids with a combined total installed capacity of about 70 MW and annual energy production of about 250 GWh (1987). However, public electricity infrastructure was destroyed during the conflict, and the associated public institutional frameworks are almost completely defunct at present. ENEE currently operates only 14 MW installed capacity in Boosaaso and Qardho in the northeastern part of the country. Private sector has stepped in to provide access to electricity, although this is limited to mainly urban areas. The energy sector in Somalia has many features common to countries in or emerging from conflict, whereby several private service providers stepped in by creating small electricity companies called energy service providers (ESPs). The most common supply of electricity in such contexts is a decentralized, private supply of electricity using relatively low-capacity medium voltage (MV) and low voltage (LV) networks with embedded small-scale high-speed diesel generators (HSDGs), initially serving their own loads and gradually expanding to serve neighborhoods.

9. **The electricity system in Somalia comprises isolated diesel-based minigrids operated by ESPs on the basis of licenses issued by ministries of energy[10].** The system of delivering electrical energy to users comprises a network of isolated distribution grids with embedded generation. These island networks are the property of ESPs, each of which owns and operates its independent generation-distribution-customer revenue chain. The ESPs supply more than 90 percent of the electricity in the country, and it is estimated that there are at least 55 operators in the large cities and towns. Some nongovernmental organizations (NGOs) also contribute to Somalia's power supply but at a smaller scale. The total estimated installed capacity in the major load centers is about 138 MW (2020) (Table 1)[11], which is inadequate to serve current and future demand, estimated to increase to between 1,000 MW to 4,600 MW by 2037[12]. This has led to a highly fragmented private electricity sector throughout the country, resulting in an inefficient and expensive supply given the lack of economies of scale. Thus, with the ongoing initiatives to enact the sector laws, substantial efforts are needed to operationalize an enabling institutional and regulatory framework with adequate staffing and capacity.

Table 1. Installed Generation Capacity in the Major Cities

City/Load Center	Estimated Installed Capacity (MW)	Tariff (US$/kWh)	Lead ESP*
Mogadishu, Benadir	47	0.25 to 0.55	BECO (Benadir Electric Company) owns about 85 percent of the total capacity
Hargeisa, Somaliland	60	0.75	SomPower owns about 95 percent. There exist 4 ESPs, out of which 3 have agreed to merge further.
Berbera, Somaliland	7	0.5	BEC (Berbera Electricity Company (BEC) operates the entire network that was formerly state owned
Garoowe, Puntland	10	0.79	NESCOM (National Energy Corporation of Somalia the main ESP

[10] The licensing is still ad-hoc at FGS level pending enactment of electricity bill, while in Somaliland there is an interim integrated generation-distribution licences with a three year validity period. However, this role has been transferred from MoEM to Somaliland Electricity Regulatory Commission.
[11] Electricity Service Providers (ESPs).
[12] Power Sector Master Plan (2019).

Boosaaso, Puntland	14	0.8	ENEE (Ente Nazionale Energia Elettrica) owns about 85 percent of the total capacity
Total	**138**		

* There is increasing interest in establishing mergers and joint ventures among ESPs.

10. **Somali government institutions are in the formative stage with nascent institutional and legal frameworks**. In the FGS, the Ministry of Energy and Water Resources (MoEWR) has the mandate to oversee operations in the electricity sector. In Somaliland, the Ministry of Energy and Minerals (MoEM) has the mandate over the energy sector. At the federal member state level, there are also ministries responsible for electricity, although most of these are yet to be fully functional. Key sector decisions are made by the MoEWR in the FGS and MoEM in Somaliland. Due to the absence of regulations and codes of practice, there is no mechanism to vet and enforce electricity services' quality or health and safety standards, thus exposing both ESP employees and the consumers to safety risks. This is further compounded by the lack of capacity to develop, enforce, and monitor the sector by the government institutions. The FGS has taken some initial steps to create a favorable enabling environment of policies and regulations that include (a) preparing and adopting a sector development plan—the Somali Power Sector Master Plan (PSMP), that aims to have in place the fundamental building blocks for establishing a modern energy sector in Somalia and (b) enacting the requisite legislation (the Electricity Act). The FGS Electricity Bill and Energy Policy were approved by the Council of Ministers in December 2020. The Electricity Bill is expected to be ratified by parliament and enacted by the end of 2021. In Somaliland, government efforts have led to the emergence of a nascent policy, legal, and regulatory framework through the Somaliland Energy Policy adopted in 2010 and Somaliland Electrical Act (2013), which is awaiting parliamentary approval.

11. **Somalia reports one of the highest costs of power in the world**. Considering the major load centers alone, there are at least 227 HSDG systems currently operating, with a median capacity of 315 kW. Of these, 113 are in Somaliland, 28 in Puntland, and 86 located in other federal member states[13]. These generators are estimated to consume over 121,000 liters of diesel fuel/day. With increasing demand for electricity, it is projected that diesel consumption could increase to 694,000 liters/day in the medium term if additional capacity is to be met by HSDGs alone. This trend is changing as ESPs are increasingly integrating renewable energy (solar and wind) in their generation mix. However, these are of small-scale capacity due to inadequate financing and limited technical capacity to design and synchronize the systems. Based on field data collected in 2017, the cost per kWh in Somalia, excluding Somaliland, ranges from US$0.25–US$1.30 per kWh, with a weighted average of about US$0.61 per kWh. In Somaliland, the cost per kWh ranges from US$0.30 to US$0.90 per kWh, with a weighted average of about US$0.68 per kWh (according to the 2018 PSMP). The World Bank's Regulatory Indicators for Sustainable Energy (in 2020) reported that Somalia ranks in the upper 5 percent globally for power cost and in the upper 15 percent globally for power expenditure as a share of gross national income (GNI) per household[14].

12. **System losses are high, varying from 25 to 40 percent**. Electricity distribution networks' losses mainly stem from the use of LV (415/240 V) as the main distribution voltage, with the lines extending over long distances and aging equipment. These losses could be much higher if losses in generation are considered. Technical losses are further exacerbated by the ESPs' duplication of generation, distribution, and retail infrastructure. In addition, the metering systems are deficient, and they cannot provide reliable data regarding electricity consumption. In some instances, ESPs

[13] South West, Hirshabelle, Galmudug, Jubbaland and Mogadishu.

[14] https://www.worldbank.org/en/topic/energy/publication/rise---regulatory-indicators-for-sustainable-energy

charge a fixed fee based on estimation of the consumer load, such as the number of lightbulbs or other appliances in use, due to lack of consumer meters. This provides no incentive for end-users to reduce equipment use or buy more energy-efficient products, contributing to overall energy inefficiency and driving up electricity costs. The Somaliland National Development Plan (NDP) II (2017–2021)[15] has set a target to reduce technical losses for each ESP by 7.5 percent by the end of 2021, through investment in new infrastructure. Investments in the sub transmission network in the major load centers are also required to strengthen the current distribution networks.

13. **Installed generation capacity is inefficiently used.** Nearly 100 percent of generation is derived from HSDGs. Due to the lack of sector regulations and limited capacity of ESPs to invest in the equipment required to synchronize existing HSDG units, coupled with a shortage of operations and maintenance (O&M) staff, most of the existing installed generation capacity is not being used efficiently. As a result, "wet stacking" (diesel fuel waste, increased pollution, performance degradation, and shorter HSDG lifespans) is widespread. By addressing the synchronization of generation units and, ideally, supplementing the thermal units with a renewable energy source, the gains could contribute to lower cost of generation by about 30 percent.[16]

The Somali electricity sector presents opportunities for effective service delivery, harnessing renewable energy and building institutions.

14. **There is significant untapped renewable energy resource potential as identified by numerous assessments, including the recent "PSMP (2019) and Renewable Energy Mapping Analysis (2020)", supported by the World Bank[17].** The country has significant potential for using renewable energy for electricity generation, particularly solar and wind energy. However, in-depth evaluation of these resources needs to be conducted before large-scale projects can be initiated to harness these renewable resources for power generation. This is particularly true for wind power generation, which is site specific. Further, shortages of technical staff, the small scale of the distribution networks, and lack of off-transmission infrastructure and associated regulations further limit the immediate large-scale development of renewables for power generation.

15. **The isolated minigrids of ESPs form the basis for an interconnected distribution network to become a national grid with the potential for wheeling and cross-network power sales**. There is increasing demand for electricity, and the required generation capacity for the country is forecast to increase from 1,000 MW to 4,600 MW by 2037 in business-as-usual and transformational scenarios, respectively (per the PSMP 2018). To meet the demand, US$3 billion would need to be invested throughout the supply chain in the next two decades. However, the absence of an interconnected distribution network and a transmission grid in the country, if not addressed in the short-to-medium term, will hamper investments and uptake of large-scale generation and new customer connections.

16. **Somalia, as part of the Horn of Africa Initiative (HoAI)[18], can leverage the opportunities offered by regional**

[15] https://mopnd.govsomaliland.org/article/ndpii-1.
[16] Results from the Energy Security and Resource Efficiency in Somaliland Project indicate that ESPs that have hybridized the HSDGs with solar photovoltaic systems coupled with battery energy storage systems have been able to reduce the consumer tariffs by about 34 percent.
[17] World Bank Group, 2020. Global Wind Atlas. https://globalwindatlas.info/; and World Bank Group and DTU Wind Energy, 2020. Global Solar Atlas. https://globalsolaratlas.info/
[18] The Horn of Africa Initiative was launched in 2019 in response to the collective vision of member countries to deepen regional integration and promote regional cooperation. The member countries of the Horn of Africa Initiative (Djibouti, Ethiopia, Eritrea, Kenya, Somalia, Sudan) and Pillar I (out of four) of the Initiative focuses on regional infrastructure connectivity for energy, transport, and digital.

integration to leapfrog the establishment of the transmission backbone infrastructure and have access to diverse and low-cost electricity supply from regional neighbors. The FGS is an active member of the HoAI and has requested support under the Initiative to develop the transmission backbone in the country and regional interconnectivity (mainly with Ethiopia) in the 2019 communiqué signed by all HoAI members.[19] The country has also reiterated its commitment to the Initiative during the October 2021 World Bank Annual Meetings. Somalia has expressed interest in joining the Eastern Africa Power Pool, and discussions are ongoing.

17. **Achieving least-cost universal electrification is estimated to require complementary supply solutions of grid, minigrid, and stand-alone solutions,** as demonstrated by the outcomes of the geospatial least-cost analysis[20]. The current ESP minigrids (mainly in urban areas) could provide a basis for the extension of the grid to the rural areas. However, a combination of high capital costs, timing required to develop and extend a national interconnected grid, and rural consumers' limited ability to pay for electricity services undermines the business case for such an approach in the short-to-medium term. Stand-alone off-grid solar solutions and greenfield minigrid developments thus offer much greater potential for accelerated access expansion. There is already demonstrated demand and need for off-grid solar products, and a variety of companies have demonstrated strong capacity to reach off-grid consumers. There is also experience in the country with the development of hybrid minigrids.

18. **The proposed project is underpinned by a five-year World Bank engagement starting with technical assistance and a trust-funded pilot lending operation.** The project is informed by critical technical assessments and capacity-building activities implemented under the ongoing US$7.2 million Somali Electricity Access Project (SEAP P165497). The SEAP recipient-executed financing by the World Bank is administered by the Somalia Multi-Partner Fund, approved on December 21, 2018 with a current closing date of June 30, 2022. The project is under implementation by the FGS and Somaliland to reduce market barriers for the private sector to provide modern energy access through solar home systems.

19. **The proposed project is part of the SOP, and a steppingstone to a long-term vision to build institutions and regulations simultaneously, with a phased infrastructure investment program for access expansion, clean energy transition, and regional interconnectivity.** The series of projects (SOP) will enable establishment of building blocks of a national integrated electricity supply industry, including the sector's physical and institutional infrastructure and sector operations with adequate capacity and clear roles and mandates for private and public actors. The proposed SOP harnesses the strengths of the existing private sector, builds its capacity, and creates a private-public interface for energy service delivery. The core proposition of this project is that by investing in sector capacity enhancement and network infrastructure, the FGS can leverage the private sector to reestablish the electricity supply industry (ESI). Further, the institutional and regulatory enhancement will support the reestablishment of transparency, trust, effectiveness, and legitimacy in the government institutions to provide an enabling operating framework for the private sector.

20. **The project deploys new battery and off-grid technologies creating a pathway toward clean energy, achievement of the nationally determined contributions (NDCs) per the Paris Agreement, and long-term green growth**. The project takes advantage of the latest advances in solar photovoltaics (PV), Battery Energy Storage Systems

[19] Communiqué signed following side event during the World Bank Annual Meetings.

[20] The FGS commissioned the "Preparation of an Indicative Least-Cost Geospatial Electrification Plan to Achieve Universal Access in Somalia," study implemented by the KTH Royal Institute of Technology, Stockholm, 2020. The analysis will also be updated to further investigate the grid extension options with their interconnection and establishment of a transmission backbone.

(BESS), and other technologies and will deploy cutting-edge electricity generation and storage technology that will help the local population access cleaner and more affordable electricity. It builds on the experience already acquired by the country for both minigrid development and solar PV deployment to scale them up across phases and builds on the international experience acquired so far. The project interventions will support the national commitments reflected in the draft 2020 NDCs, setting the target of 30 percent greenhouse gas (GHG) reduction against a business-as-usual scenario by 2030. The activities will increase the installed renewable energy installed capacity in the country and thus support the "green" transition away from diesel-based generation. The project is part of the new World Bank resilience rating pilot and resilience measures to protect and prevent disruptions in physical infrastructure due to climate shocks will be incorporated in feasibility studies and detailed designs to be undertaken during project implementation. Lastly, the complementarity between the SOP and the proposed Horn of Africa Regional Integration for Sustainable Energy Supply project will also ensure that Somalia can take advantage of the benefits of regional integration for accessing additional renewable power through imports.

21. **The project will support expansion of energy access, promote service reliability, and create conditions for universal electrification**. The project will interconnect and rehabilitate the existing power supply infrastructure to optimize existing generation and distribution assets. It will also expand the infrastructure to develop a national grid connecting the main load centers. By improving sector operations efficiency, the project and the SOP will support the provision of more reliable and affordable electricity services and thus set the stage for an accelerated access expansion in future phases of the program. In addition, the program will also support the country in establishing adequate and holistic long-term sector planning for the achievement of universal access, based on least-cost principles, with clear targets and timetables, priority connectivity to social facilities and for productive uses, and a programmatic approach to syndicate financing. Improved sector planning and operations will ensure the sustainability of long-term efforts and build confidence in private investors, Development Partners, and establish a consultative sector-wide approach.

22. **The project will prioritize electricity services to health care facilities and schools as a COVID-19 economic recovery response**. Over the past year, the COVID-19 pandemic has caused an unprecedented global economic and social crisis, significantly affecting all aspects of life. The project will contribute to about 25 percent of the overall investment needs to provide access to the rural priority facilities identified by the counterparts, complementing the outreach of the Somalia Education for Human Capital Development Project (P172434) and the Improving Healthcare Services in Somalia (P172031) projects. The interventions will increase the readiness of health facilities for COVID-19 response and increase resilience of the beneficiary population.

23. **The project will closely collaborate with the International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA).** IFC will support targeted upstream interventions to augment the private sector role and participation toward long term sustainability of the electricity sector. To this end, IFC will build on the various engagements in the electricity sector in Somalia over the past few years[21] to focus on the following areas:

- Continue assistance in formulation of enabling laws and regulations, following international best practices, including the Electricity Energy Bill (that has been drafted with IFC assistance) and provide requisite capacity building to enable an effective regulatory function.
- Provide capacity-building support to the ESPs through focused trainings to implement international standards of technical, commercial, Environmental Social and Governance Impact, financial management and reporting aspects of the business.
- Given that there is a significant public sector led investment under the proposed engagement, IFC will

[21] Please refer to Annex 9.

leverage on its experience and knowledge to help structure and design practical and effective interface mechanisms between public sector and ESPs based on a fair and balanced risk and return allocation criteria.

24. **MIGA has actively engaged with potential investors interested in Somalia across all sectors since Somalia became a member of MIGA in March 2020**. In the energy sector, MIGA has received early-stage enquiries on several wind and solar PV projects across Somalia to address regional access and rural electrification. MIGA has now been mandated to support the developers of a small solar plant that will supply power to commercial and industrial customers, including UN agencies. As the off takers of this project are private, MIGA will not offer its Breach of Contract cover, but MIGA's other risk covers, namely Expropriation, Transfer Restriction and Convertibility, and War and Civil Disturbance will be available.

C. Relevance to Higher Level Objectives

25. **The project contributes to the World Bank Group (WBG) twin goals of eliminating extreme poverty and boosting shared prosperity as well as the UN Sustainable Development Goal (SDG) 7**. Activities under the project aim at expanding access to electricity, which is a fundamental input for socio-economic development, and will establish an enabling environment for long-term, sustainable, growth. As such, the project will also contribute to the achievement of the broader SDG agenda. The project is aligned with World Bank Group Climate Change Action Plan 2021-2025 that aims to advance the climate change aspects of the WBG's Green, Resilient, and Inclusive Development approach, which pursues poverty eradication and shared prosperity with a sustainability lens. In the Action Plan, the World Bank supports countries and private sector clients to maximize the impact of climate finance, aiming for measurable improvements in adaptation and resilience and measurable reductions in GHG emissions.

26. **The project aims to support the FGS' National Development Plan (NDP) 9 (2020–24)**[22] that has a strong focus on tackling poverty and building resilience. The NDP9 strategic interventions focus on four pillars: (a) Inclusive and Accountable Politics; (b) Improved Security and the Rule of Law; (c) Inclusive Economic Growth (including increased employment); and (d) Improved Social Development. The NPD9 outlines five strategies for the energy sector for the next five years: (a) developing renewable and non-renewable energy sources to increase supply, (b) establishing a national regulatory authority for energy market governance, (c) strengthening the administrative and technical capacity of the federal and states ministries of energy, and (d) providing access to energy to all populations, including vulnerable groups - particularly women, the youth and displaced persons. Somaliland priorities are: (a) access to electricity raised to at least 85 percent for 25 percent of Somaliland urban and rural households, respectively; (b) 10 percent of national energy generation to be provided by renewable energy sources; (c) a 30 percent reduction in the average tariff; (d) increased investment in renewable energy technology, infrastructure, and research; (e) a reduction of system losses for energy service providers; and (f) additional generation of 30 MW.

27. **The project is aligned with the Somalia's Nationally Determined Contribution (NDC)**[23]**, and the National Adaptation Program of Action (NAPA)**[24]. Somalia's NDC target under the mitigation component is to reduce GHG

[22] https://mop.gov.so/wp-content/uploads/2019/12/NDP-9-2020-2024.pdf.
[23] "Somalia's Nationally Determined Contribution to the UNFCCC." 2015. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Somalia%20First/Somalia%27s%20INDCs.pdf.; Draft NDC Update, December 2020.
[24] Somalia's National Adaptation Program of Action on Climate Change (NAPA)." 2013. https://unfccc.int/resource/docs/napa/som01.pdf.

emissions by 30 percent below a business as usual (BaU) scenario by 2030. The destruction of the natural resource base (forest and range resources that provide the raw material production of charcoal in Somalia) is identified in Somalia's NDC as one of the greatest challenges and a key driver of recurrent humanitarian crises in the country due to severe droughts and impacts on pastoralist activities. The program will help Somalia's move to greener trajectory through utilization of renewable energy, contributing to the reduction of GHG emissions and helping achieve NDC and NAPA objectives.

28. **The project supports the World Bank Group Strategy for Fragility, Conflict, and Violence (FCV) 2020–25**. The strategy centers on the World Bank's role as a development actor committed to sustained and long-term engagement to sector-wide regulatory and policy reform, and more focus on client capacity building and proactive implementation support. The project will support the four pillars identified under the strategy: (a) preventing violent conflict and interpersonal violence by addressing the drivers of fragility, such as economic and social exclusion, gender inequality, and climate change risks; (b) supporting the transition out of fragility by promoting a renewed social contract and strengthening the legitimacy and capacity of core sector institutions; (c) fostering a healthy local private sector as well as public and private sector solutions to help create jobs, deliver services, foster social cohesion, and promote inclusive economic development; and (d) mitigating the spillovers of FCV countries by adopting a regional approach to infrastructure development and service delivery.

29. **The project is aligned with the Country Partnership Framework (CPF) for the Federal Republic of Somalia for the Period FY2019–22[25] endorsed by the World Bank Board of Directors on September 25th, 2018; and the country's COVID-19 recovery program.** In line with the CPF, the project will support energy access, inclusive social growth, and rural resilience and productivity, which are catalysts for unlocking Somalia's growth potential. The project also contributes to a resilient recovery in line with the World Bank–Somalia COVID-19 response program by (a) electrifying health facilities, which is a necessary building block toward a pandemic ready health system; (b) catalyzing green business growth by increasing renewable energy generation; and (c) supporting job creation in the energy sector, especially for female science, technology, engineering and mathematics (STEM) profiles).

30. **The project supports the implementation of the World Bank Group Gender Strategy[26].** The gender interventions are aligned with the World Bank Gender Strategy Pillars, (a) Improvement of Human Endowments through delivery of electricity to health care facilities and schools, (b) Removing Constraints for More and Better Jobs and (c) Removing Barriers to Women's Ownership and Control of Assets. The project design includes targeted interventions to improve access to electricity services, improve female participation in the sector workforce, and mainstream gender equality across sector institutions.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

31. The Project Development Objective is to increase access to lower cost and cleaner electricity supply in the project areas and to reestablish the electricity supply industry.

[25] Report No. 124734-SO.
[26] https://openknowledge.worldbank.org/handle/10986/23425?show=full.

PDO Level Indicators

32. Progress toward achieving the PDO will be measured by the following project outcome indicators:
(a) Increase in electricity supply (MWh)
(b) Generation capacity of energy constructed or rehabilitated (CRI, MW)
(c) Annual greenhouse gases emissions avoided (tCO_2)
(d) Decrease in tariffs under the project (percentage)
(e) Establishment of the Electricity Supply Industry institutions with clear roles and responsibilities (Yes/No)

SERIES OF PROJECTS

33. **The Somali Electricity Sector Recovery Project (SESRP) has been conceptualized as the first of a series of three projects: (a) electricity sector recovery, (b) electricity sector development, and (c) electrification scale-up.** The SOP Development Objective is to increase access to lower cost and cleaner electricity supply in the Program Areas. The vision has four themes: (a) infrastructure development, (b) renewable energy generation, (c) electricity supply to public institutions, and (d) sector capacity enhancement. These themes aim to achieve the following outcomes: (i) Increased access to lower cost of electricity supply from diverse energy resources especially from renewable energy resources for climate change mitigation; and increased access to electricity services; (ii) Improved access to functional health and education services; and (iii) Sector institutional, legal, and regulatory enabling environment for sustained sector operations, including enhancing both the public and private capacity to manage and operate the sector.

34. **The SOP will establish a win-win-win relationship among public institutions, private service providers, and customers**. Provision of basic services like electricity could play a key role in shoring up the legitimacy of the government as it seeks to reestablish its authority over the country, and thus the need for effective development planning for areas that have seen themselves as marginalized or recently leaving conflict. The project will reestablish the mandate of public institutions in the power sector and the provision of public financing to ensure equitable and more reliable and affordable access to electricity services for the Somali population. The expanded role of the ESPs will help buttress and encourage an increased involvement of the private sector in the long run in both distribution and generations subsectors, while maintaining Somalia's decentralized service structure. In addition, improving electricity access and affordability will help the country address poverty through increasing household incomes, as access to affordable electricity can create opportunities for the creation of new businesses. Increased and improved electricity services provide an opportunity for the FGS to help the population see benefits of the reestablishment of state authority with improved service and economic dividends. Detailed description of the SOP is in Annex 1.

B. Project Components

35. The SESRP will consist of the following four main components:

Component 1. Sub-transmission and distribution network reconstruction, reinforcement, and operations efficiency in the major load centers of Mogadishu and Hargeisa (US$75 million equivalent)

36. This component will improve network reliability and operational efficiency by interconnecting the current ESPs' distribution networks and existing generation to optimize overall distribution network operations. These activities will support the ESPs to (a) decrease the cost of operations (increased generation efficiency, reduction in distribution

network losses, and distribution network duplications) and (b) improve electricity supply and reliability.

37. **Sub-component 1a: Generator Synchronization and Automation**. Currently, most of the ESPs have not implemented synchronization and automation as part of their generation processes. Therefore, separate generator units are connected to exclusive feeder lines. As a result, many generators operate below their expected optimal performance criteria. Further, the absence of automation and synchronization prevents the ESPs from utilizing parallel generation to ensure optimal generator performance and dynamic reactivity to electricity load variations. This kind of operation results in significant amounts of "wet stacking" (diesel fuel waste, extra pollution, and performance degradation). These all combine to reduce the potential maximum generation power output, reduce lifespans of the generator engines, and elevate maintenance costs and unscheduled generation downtime. Investments under this sub-component will support equipment supply and installation that will enable synchronization and automation of the numerous generators presently in operation. The investment in each of the targeted major load centers (Mogadishu and Hargeisa) will provide reduced cost of generation accruing from augmentation in generation capacity and reduced wet stacking resulting in lower fuel consumption and maintenance costs, reduced pollution levels and GHG emissions.

38. **Sub-component 1b: Sub transmission and Distribution network interconnection in the major load center of Mogadishu and Hargeisa**. Most of the ESPs with a presence in the targeted project areas operate independently with significant infrastructure and operations duplication.[27] In addition, lack of network interconnection limits the opportunity to share existing generation facilities and the prospect of investing in larger capacity and more efficient generation systems. The subcomponent activities will support investments in the sub-transmission, and distribution network infrastructure required to enable generation synchronization and interconnection between the different ESP networks in addition to increased network capacity and reduced network losses. The intention to focus on establishment of an interconnected sub-transmission and distribution network is deliberate, considering the need to consolidate the currently existing investments in infrastructure and concretize the "bottom-up" infrastructure building blocks required to meet increasing electricity demand. The increased interconnectivity also provides a better demand base for future regional interconnections to the Eastern Africa Power Pool (EAPP).

Component 2. Hybridization and battery storage systems for minigrids (US$20 million equivalent)

39. This component will support activities aimed at the hybridization and optimization of existing mini grids. It will support installation of Battery Energy Storage Systems (BESS) and Solar Photovoltaic (SPV) systems at existing diesel-based generation stations in selected load centers. Possible load centers to be considered under this component have not been agreed upon, but may include other cities, such as Baidoa, Garowe, Berbera, Bosaso, Abudwak, Afgoye, Kismayo, Borama, Burao, and other cities as may be determined by the government. This component aims at increasing the efficiency of the existing hybrid mini grids (diesel and solar) by optimizing the generation capacity and, where possible, reducing the diesel consumption by augmenting the installed capacity with BESS and additional SPV generation. There are several ESPs that have commenced converting their generation systems into hybrid electricity generation, mostly via SPV. These systems are synchronized to operate as part of SPV-HSDG hybrid generation, with the solar component providing daytime generation. Such hybrid opportunities offer significant improvements in fuel efficiency, fuel consumption, extended generator lifespans, reduced GHG emissions, and reduced combustion pollution, along with less reliance on fuel imports. In addition, hybridization has enabled some ESPs to reduce the electricity tariffs by about 40 percent.

[27] There are three major ESPs in Mogadishu (Blue Sky, Mogadishu Power, and BECO). In Hargeisa there are four ESPs, of which three led by SomPower are in talks to merge their operations.

40. **Selection criteria**. The beneficiary ESPs will be selected taking into account the following criteria: (a) regional balance with regard to the project scope coverage, to include some of the large load centers in the FMS; (b) maximum impact (reduced GHG emissions) based on the existing load demand; (c) optimized investment costs, for example, ESPs with existing hybrid SPV already installed but without battery storage would be ranked higher due to the lower cost; (d) availability of land at the existing ESP generation sites for additional infrastructure; and (e) ESPs' willingness to enter into agreement with government on the operations and maintenance of the assets; and commitment to achieving minimum performance standards[28].

Component 3. Stand-alone solar off-grid access to public institutions (Health and Education) (US$40 million equivalent)

41. This component complements and expands ongoing activities under the Somali Electricity Access Project (SEAP) (P165497). While SEAP already provides support for nation-wide solar home system (SHS) connectivity scale-up, including for the nomadic population,[29] this component will expand activities to target health and education facilities, which were not part of the SEAP project scope.

42. The component will finance the delivery, installation, and operation and maintenance (O&M) for Lighting Global–certified SPV systems over the lifetime of the project for selected education and health facilities. Besides playing a key role in enablement of community co-benefits, facilities that have access to electricity may be better positioned to attract and retain skilled workers, especially in rural areas. Further, this component will equip public service institutions to better respond to emergencies, such as COVID-19. The activities under this component support the resilience of the Somali population from the conflict's impact on livelihoods through improved access to functional basic services, such as health and education facilities.

43. Selection of the facilities will be underpinned by the Least-Cost geospatial analysis and the list of priority facilities identified by the FGS (in consultation with the FMS) and Somaliland. The overall financing needs for providing access to the 4,141 health and education facilities identified by the government is about US$160 million. The project will provide electricity access to 585 facilities prioritized by the government following the identification of selection criteria agreed with the ministries of energy, health, and education[30]. Selection criteria include (a) rural and remote areas with no connectivity, (b) priority connectivity to maternal health centers and secondary schools, (c) presence of both health and education facilities, and (d) presence of internally displaced persons (IDPs) and high levels of poverty and vulnerability. The project activities will also be complemented by similar interventions under the Somalia Education for Human Capital Development (P172434) and the Improving Healthcare Services in Somalia (P172031) projects.

44. The component will contribute to about 25 percent of the overall investment needs to provide access to all the priority facilities identified. An analysis of prioritized sites suggests that 205 health facilities and 380 educational facilities can be electrified with the proposed US$40 million budget under component 3. The preliminary budget

[28] These include but not limited to: (i) hours of service; (ii) expansion of service access (i.e. increase connections and area of coverage, as well connection of targeted educational and health facilities); (iii) reduction of technical losses; (iv) improved receivables collection; (v) reduction of service tariffs; (vi) corporate financial management ratios; and (vii) minimum social and environmental standards for service provision and assets management and operation (including operational health and safety standards).

[29] SEAP provides, under component 1—electrification of households and businesses through stand-alone solar home systems (US$3 million)—results-based grant financing to provide off-grid connectivity.

[30] Prioritization was also informed by the mapping of health facilities conducted under the Improving Healthcare Services in Somalia (Damal Caafimaad, P172031) project.

breakdown is provided in **Table 2**. The preliminary budget was split in favor of health facilities (US$30 million out of the US$40 million for component 3) to emphasize the importance of the health sector in responding to ongoing shocks (providing adequate power to the facilities to improve their readiness to respond to the spread of the COVID-19 pandemic) and to increased resilience in the future.

Table 2. Preliminary estimates of facilities to be connected under the project

Type	Number	Unit Capacity (kW)	Unit Consumption (kWh per year)	Unit Cost (US$, thousands)	Total Installation Cost (US$, million)	Total O&M Cost[a] US$, million)	Battery replacement cost[b] (US$, million)
Health facilities							
Hospital	10	148	518,592	885,040	8.8	0.9	2.3
Health Center/Unit[c]	170	10	35,040	59,800	10.2	1.0	2.7
Maternal Health Clinic	25	20	70,080	119,600	10.2	1.0	2.7
Subtotal	**205**				**22.0**	**2.2**	**5.8**
Educational facilities							
Primary[d]	100	2	1,444	14,053	1.4	0.1	0.1
Secondary	250	4	2,458	23,920	6.0	0.6	0.5
NFE	15	2	102	11,960	0.2	0.0	0.0
Tertiary[e]	15	9	460	5,517	0.8	0.1	0.1
Subtotal	**380**				**8.4**	**0.8**	**0.7**
Totals	**585**				**30.4**	**3.0**	**6.6**
Total (US$, million)							**40.0**

Source: World Bank estimates.
Notes:
[a] O&M contract duration is five years.
[b] Assuming the battery pack is replaced during the O&M contract. Assumed battery cost is US$165 per kWh. The size of the battery is estimated on the assumption that the battery needs to be able to store the daily expected consumption at a 40 percent load factor.
[c] Health centers/units include referral health centers, IDP health centers, primary health units, and IDP primary health units.
[d] Primary schools include sites identified as H/Dhexe (Primary and Middle School).
[e] Tertiary education facilities include Universities and TVET (Technical and Vocational Education and Training).

Component 4 – Institutional Development and Capacity Building (US$15 million equivalent).

45. Component 4 consist of five activities tailored to the re-establishment of the sector's soft infrastructure for the adequate day-to-day management and establishment of an enabling institutional and regulatory environment for sector operations. Together, these activities will lead to the rebuilding of the electricity supply industry in the country and establish the fundamentals for sector development and private sector participation sustainable in the long run. They include the establishment of the institutions with clear roles and responsibilities[31], and the development and implementation of policies, sector strategies and secondary regulations for the sector. The component will also support the implementation of the recommendations provided under the ongoing Electricity Supply Industry (ESI) Institutional Design option analysis for sector development and project implementation arrangements:

a) *Sub-component 4.1 – Policy and regulatory development*. The technical assistance is aimed at strengthening

[31] i.e the FGS National Electricity Authority to be stablished after the electricity bill is enacted; and Somaliland Energy Regulatory Commission.

sector governance and regulation to foster autonomy, accountability, and transparency. Specific activities will include sector policy, regulation, planning, management, and operations. This sub-component would also provide technical assistance for renewable energy development; and how ESPs would be regulated in the future.

b) *Sub-component 4.2 - Sector Planning and Feasibility Studies for Renewable Energy Projects*. Following the adoption of the PSMP, there is a need to undertake detailed feasibility studies, such as site-specific wind resource measurements and geothermal prospecting, as well as renewable minigrids pre-feasibility studies building on the results of the geospatial Least Cost assessment prepared under the SEAP project. The technical assistance will also support MoEWR and MoEM to undertake integrated planning, including preparation of a Least-Cost Development Plan covering generation, transmission, and distribution as well as an Electricity Access Strategy and Investment Prospectus.

c) *Sub-component 4.3: ESP and MOEWR/MOEM Business Support Services*. The technical assistance will support ESPs to enhance their capacity in utility business management operations. It will also assist them in setting up business processes to enable their compliance with license obligations and support growth of businesses and revenues for long-term additional sector investments. The assistance aims to enhance and increase the role of the ESPs, and the private sector in general, in sector ownership, management, and operations - initially through support and guidance of the day-to-day sector undertakings with a business support services firm (BSSF) approach. The BSSF would also potentially promote renewable energy development and/or resilient energy infrastructure through capacity building of the ESPs by integrating potential activities such as operations and management of solar PV and hybrid facilities and climate and disaster screening and management for energy assets.

d) *Sub-component 4.4: Project Implementation Support including for environment and social safeguards*. This sub-component will finance execution, design, and supervision consultants to assist the MoEWR and MoEM Project Implementation Units (PIUs) and associated agencies in project implementation, sector management, and coordination. This sub-component will also support key functions of the PIU project management teams (project management, procurement, financial management [FM], safeguards, and monitoring and evaluation) required for project implementation. The sub-component will also include technical assistance to enhance sector fiduciary arrangements as well as setting up an E&S risk management system, enhancing the E&S capacity through staffing and training on the Environmental and Social Framework (ESF) requirements based on a robust capacity building plan. The Sectoral Environment and Social Assessment shall inform the sector-wide development framework and E&S risk management capacity and performance for the sector. Specifically, the sub-component will finance the owner's engineer (OE) consultancy services to support the PIUs regarding project design, procurement, and contracts' management, including fiduciary and E&S aspects. A dedicated E&S firm will support the PIUs in the areas of health, safety, labor management, land, resettlement, community engagement and security. In addition, the sub-component will support other technical assessment and capacity-building activities for the successful implementation of the project. This will include, for instance, trainings for the Ministries of Health and Education for the management and operations of the SPV systems beyond the lifetime of the project.

e) *Sub-component 4.5: Implementation of a Gender Action Plan*. This sub-component will support a series of interventions envisioned to close the identified gender gaps. A preliminary gender assessment was conducted

at project preparation to identify specific gender gaps in the energy sector, particularly barriers that limit career progression for women. The following activities will be conducted: (a) development and endorsement of a detailed Diagnostic Gender Gap Assessment, (b) Pilot incubator for women's employment, (c) development of detailed gender actions plan, including capacity building on gender issues in the sector.

Project Cost and Financing

46. The total project cost is estimated at US$150 million equivalent. The estimated project breakdown by components is provided in table 3.

Table 3. Project Costs and Financing

Components	IDA Financing (US$ million)
Component 1: Subtransmission and distribution network reconstruction, reinforcement, and operations efficiency in the major load centers of Mogadishu and Hargeisa	**75**
Component 2: Hybridization and battery storage systems for minigrids	**20**
Component 3: Stand-alone solar off-grid access to public institutions (health and education)	**40**
Component 4: Institutional Development and Capacity Building	**15**
Total	**150**

47. Approximately US$50 million of the total allocation will be available to Somaliland to implement activities. To access these funds, FGS and Somaliland will need to reach agreement for arrangements for funds flow from the Recipient to Somaliland. Disbursements will be made under this Category (2) of the Financing Agreement. In case these funds are not accessed by the time of the Project's midterm review, they will be canceled.

C. Project Beneficiaries

48. **Households**. The project will support improved electricity service delivery in the major load centers of Mogadishu and Hargeisa and in potentially seven more main load centers for renewable energy generation optimization through hybridization of mini grids (component 2). The project will also provide benefits from improved health and education services. Overall, the project will benefit about 1.1 million households, equivalent to almost 7 million people, of which 3.5 million will be females, including those benefiting from improved health and education services.[32]

49. **Health centers and schools**. The project will provide electricity access to approximately 585 social institutions, 205 health facilities (including hospitals, health centers/units, and maternal health clinics) and 380 schools (including primary, secondary, tertiary, and non-formal education facilities). Overall, the project is expected to provide improved health services for 330,000 households (about 2 million people), and improved education services for 83,000 households (about 500,000 people).

[32] This assumes 6.2 people per household, an electricity access rate of about 70 percent in urban areas, and a 50 percent female population.

50. **Sector institutions**. In addition to the direct beneficiary households, the sector institutions, including the public (MoEWR/MoEM) and the private sector (ESPs), are expected to benefit from the reestablishment of the ESI. Associated improvements in the efficiency, transparency, and accountability of the sector operations will not only shore up the sector's performance but also enhance the image and credibility of the institutions and thus build support for sustained operations. The project will also benefit the Ministries of Health and Education and their service delivery.

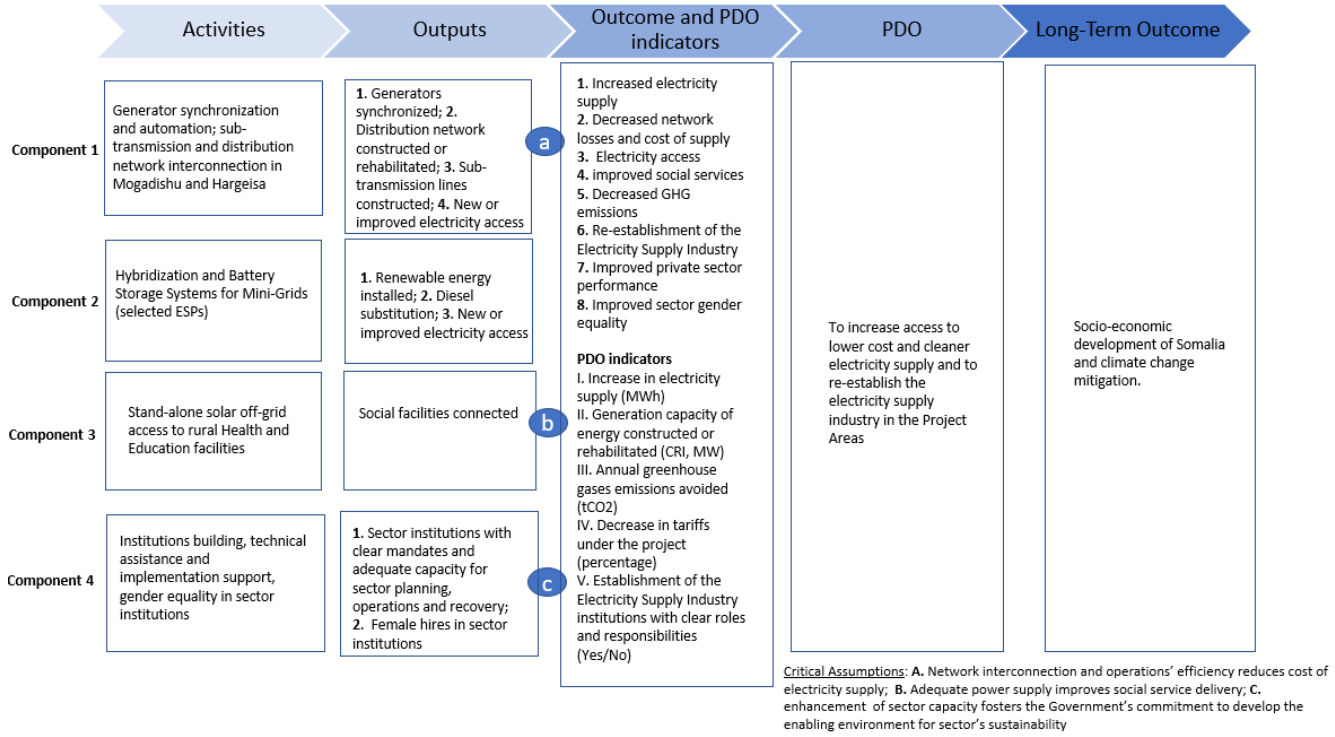
51. **Increased profitability of productive enterprises and job creation**. Improved reliability of electricity supply will contribute to increased productivity and income of productive enterprises and thus create opportunities to increase jobs for the general populace.

52. **Improved performance of the ESPs**. The project will improve the efficiency in the utilization of the existing and expanded assets of the beneficiary ESPs under components 1 and 2. In addition, the whole private sector in the country will benefit from the support provided under component 4 for improved commercial and operational performance.

D. Results Chain

53. The theory of change underpinning the project is captured in figure 1**Error! Reference source not found.**.

Figure 1. Theory of Change and Results Framework



E. Rationale for Bank Involvement and Role of Partners

54. **The project's design builds on the World Bank's experience of supporting local institutions in FCV countries, with the goal of preserving local knowledge to improve service delivery and build back better.** The project's focus to establish critical sector institutions is driven by the findings of previous Independent Evaluation Group reports and the *World Development Report 2011: Conflict, Security, and Development*, and it leverages previous World Bank experience in FCV situations (e.g., in Republic of Yemen, Iraq, West Bank, and Gaza). In addition, the SOP vision builds on the successful long-term engagement implemented by the World Bank in countries such as Bangladesh, Kenya, Rwanda, and Vietnam to build and strengthen sector institutions, develop a national power infrastructure, and support the electrification agenda.

55. **Provision of basic services like electricity is paramount to socio-economic development of the country.** Thus, there is a need to ensure effective development planning for areas that have seen themselves as marginalized for years or that are just emerging from conflict. Electricity supports services that are critical for development. In addition, improving electricity access and affordability will help the country address poverty by increasing household incomes: increasing access to affordable electricity can create opportunities to create new businesses and associated jobs. Increased and improved electricity services provide an opportunity to the FGS to enhance its visibility, so that the Somali populace can quickly perceive benefits to the reestablishment of state authority as it experiences improved service and economic dividends. The expanded role of the ESPs will help buttress and encourage an increased involvement of the private sector in the long run in both distribution and generations subsectors.

56. **Role of partners**. The project and the SOP will establish a technically sound institutional policy, regulatory, planning and infrastructure development experience to rally donor's support for sector development. Several development partners are active in the energy access space in Somalia and have been important partners of the FGS, government of Somaliland (GoSL), and the World Bank. These include the US Agency for International Development (USAID), Swedish International Development Agency (SIDA), and the UK Foreign, Commonwealth & Development Office (FCDO)[33]. Additionally, as project activities will also support the HOAI, it is expected that support from its key development partners (European Union and African Development Bank) could also be rallied. The project will leverage the existing development partners coordination mechanisms and procedures and comply with the 2015 Paris Declaration on Aid Effectiveness.

F. Lessons Learned and Progress and Reflected in the Project Design

57. **Leverage the ongoing World Bank Group Energy Sector program in Somalia**. The project is underpinned by several years of analytic building blocks and client capacity building. It will complement and leverage the WBG's past and ongoing programs in Somalia by scaling up activities to reestablish the Somali ESI to improve service delivery to enhance job creation and public services delivery. Since the Somalia re-engagement in 2013, the World Bank established a Multi-Partner Fund, which helped stabilize key institutions and pilot important initiatives now ready for scaling up under the CPF covering FY2019–22. An objective of the ongoing SEAP (P165497) is to expand access to electricity in targeted urban, peri-urban, and rural communities by supporting activities to reduce market barriers to the private sector to provide electricity through solar home systems. SEAP is also financing analytical work to enable

[33] Annex 5 summarizes specific energy sector interventions by development partners in Somalia

electrification through solar-powered/hybrid minigrids and supporting activities to strengthen the capacity of the MoEWR and MoEM for overall energy sector management and integrated electricity sector planning.

58. **Deploy WBG instruments and inter WBG team collaboration to maximize finance for development**. The project design aims to establish an enabling environment to both sustain and enhance the ongoing private sector investments (ESPs) and create opportunities for their scale-up. IFC is also increasing its engagement in the sector, as it presents significant growth potential where the ESPs are targeting to increase their generation, and renewable, capacity to meet currently unmet and growing demand. IFC expects its energy sector program in Somalia to evolve with a combination of structured financing support and technical assistance to ESPs, helping them meet their growth objectives and achieve long-term sustainability with acquisition of industry best practice technical knowledge, skills, and capacity and adoption of international Educational Software for Guiding Instruction (ESGI) standards. The project design has benefited from IFC upstream support (such as the electricity bills that were prepared with the support of IFC), and the design includes aspects that will be complemented by IFC, especially the ESPs' business development support, enhancing the regulatory environment for increased private sector investments, and priority project structuring (such as the adaption of the standardized templates for IFC's Scaling Solar Program). Activities implemented by IFC are discussed further in annex 8.

59. **The design of the project, especially component 2, draws lessons learnt from a recent project - the Energy Security and Resource Efficiency in Somaliland (ESRES) that was implemented in Somaliland with financing from FCDO**. The project piloted initiatives to (a) integrate renewable energy to existing HSDGs creating SPV/BESS/HSDG hybrid mini grids leading to reduced cost of generation and (b) support participating ESPs to reduce network technical and commercial losses. The project has demonstrated the feasibility of solar power in reducing the cost of generation and ESPs' willingness to provide capital investments into SPV-based generation capacity. The project provided financing for nine hybrid mini grids with installed SPV capacity of 5.7 MWp and four BESS systems with a total capacity of 2.6 MWh. This led to reduced diesel consumption of about 3.4 million liters per year and reduced GHG emissions equivalent to about 8,822 tons of CO_2 annually, with an expected lifetime saving of 175,000 tons. Eight of nine ESPs reduced the tariff by about 34 percent. ESPs also installed capacity of SPV/BESS equivalent capacity of 21.2 MWp in four years. Key lessons from the project include the following: (a) ESPs require significant technical assistance to enhance their operations and uptake emerging technologies; (b) there is a need to support increased uptake of electricity services, especially for productive use; (c) there is a need for a conducive institutional, legal, and regulatory framework for sustained operations; and (d) most of the ESPs have a limited ability to raise capital to expand their operations, especially in terms of large-scale, renewable energy–based generation.

60. **Lessons learned from the implementation of the SEAP project have been incorporated into project design**. The SEAP project has been the first project implemented by the counterparts, and highlighted the need for strengthening the safeguards, procurement, and financial management capacity of the PIUs. Critical gaps have been identified and included in the design of Component 4. In addition, the project provides technical assistance for improved sector planning, which is also been complemented by improved assessments and capacity building under Component 4. Finally, Component 3 was informed by the lessons learned from providing access to households and Small and Medium Enterprises with SHS systems.

61. **Lessons from past and global experience on service provision to public institutions were incorporated in the project design to ensure sustainability.** The lack of public financing for access provision to health and education facilities has emerged as a key constraint for scaling up access to electricity services (both grid and off-grid) and for the

adequate O&M of the connections provided. As a result, when stand-alone off-grid PV systems are provided with donor and public financing, they often end up as stranded assets; lack of earmarked financing for O&M and the lack of skilled technicians to operate and maintain the systems are key constraints. This is further compounded by a lack of in-house capacity in the respective ministries of health or education to integrate energy planning for functional facilities. These ministries have traditionally perceived the role of electricity services provision as an obligation of the energy ministry and related institutions—the health and education ministries lack budget resources to maintain the associated energy assets and payment for consumption. Though the project will adopt the current practice of access free of charge (through public financing), the project will provide training and capacity-building activities to the beneficiary institution staff. This will enable the establishment of a workforce capable of managing the systems after the lifetime of the project and leading facilities' planning, operations, and maintenance. The beneficiary ministries will also be required to allocate adequate financing to the O&M after the duration of the project to ensure the sustainability of operations. Based on the entrepreneurial experiences witnessed in other contexts of fragility, to support the revenue stream required to allocate an adequate public budget for the operations of the systems after the lifetime of the project, a pilot will be conducted in selected facilities for the provision of auxiliary services.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

62. **The project will rely on the existing institutional and implementation arrangements established under the ongoing SEAP**. The project will be implemented by the two PIUs established at the MoEWR and the MoEM, in close coordination with the FMSs, the beneficiary ministries, and ESPs. Given the nascent capacity within the implementing agencies and PIUs, the Owners Engineer firm will be recruited to support the PIUs in project design, procurement, and contract management, including fiduciary, environment, and social risk management aspects, and project monitoring and evaluation. A BSSF with experience in utility operations will be hired by each PIU to support selected ESPs. The BSSF will assess capacity of ESP to manage the E&S aspects in their operations and strengthen the ESPs' technical and institutional capacity in key functions of Electricity Utility Business including but not limited to Corporate Planning, commercial and network management and operations.

63. To strengthen project oversight, an independent monitoring and verification firm will be hired to provide independent audits (covering technical, fiduciary and safeguards among others) including assessment of E&S performance of contractors and ESPs against the subproject specific mitigation plans. In addition, a Project Steering Committee (PSC) will be constituted at the line ministries with high level representation of the Ministry of Finance to provide overall oversight of project implementation and policy guidance. The Energy Sector Working Group (ESWG) will be constituted at the MoEWR and MoEM level to provide guidance on project implementation; provide a forum for sector dialogue, ownership, and accountability among government, the development partners, and other sector stakeholders. Detailed implementation arrangements are described in annex 2.

B. Results Monitoring and Evaluation Arrangements

64. The project monitoring and evaluation (M&E) system incorporates the PDO and intermediate indicators that will be used to track both project implementation progress and attainment of the intended objectives at completion. The M&E also includes several sex-disaggregated results indicators to monitor and assess both progress in

implementing gender-related activities, including narrowing of identified gender disparities, and project benefits for women and men. Monitoring of results will be a key responsibility of the PIUs. The PIUs will be responsible for collecting, verifying, and collating information, integrating the M&E reports, and submitting to the World Bank both quarterly and annual progress reports. The PIUs shall establish a database for each component of the project to periodically monitor the evolution of implementation, outputs, and results, with systems for regular data gathering and processing of information required to monitor the main performance indicators and intermediary indicators as defined in the results framework. The PIUs shall collect and compile data to provide a basis for a compressive mid-term review. The Project Management Teams will also undertake an end-of-term review and write a final Implementation and Completion Results Report.

C. Sustainability

65. **The proposed series of projects (SOP)** is a steppingstone to long term vision to build institutions and regulations, as well as phased infrastructure investment program for access expansion, clean energy transition, and regional interconnectivity. The SOP will enable establishment of building blocks of a national integrated electricity supply industry, including the sector's physical and institutional infrastructure and sector operations with adequate capacity and clear roles and mandates for private and public actors, thereby creating conditions to enhance sustainability of the sector and activities.

66. **The ongoing government-led initiatives to enact the sector laws and the willingness to have an enabling institutional and regulatory framework, in addition to the sector policies already adopted, support the project's long-term impact and sector sustainability.** They address (a) increasing the reliability, efficiency, and accountability of electricity service delivery; (b) promoting private sector participation; and (c) improving the sector management and performance.

67. **The multi-pronged approach of the project encompassing both investments to improve the quality of electricity services and sector re-establishment for improved operations and sustainability of systems, processes, and incentives that will allow electricity services to be provided.** By focusing on improving quality, this project will contribute to socioeconomic development, firm competitiveness, and job creation over the long term. Efficient sector operations hinge on the development of management systems to inform decision-making and put in place the tools and processes required to operate effectively. The project-supported sector capacity enhancement and technical assistance will help improve (a) quality of electricity services, (b) sector-wide planning, and (c) enhanced role of the private sector (the ESPs).

68. **A key component of the project is the BSSF support to ESPs.** It is envisaged that the BSSF will support selected ESPs in defining and implementing the business improvement plans, including performance indicators, which will facilitate the operators' ability to comply with regulatory and license obligations and enable them to build the capacity needed to grow their business. Over the long term, increased private sector participation will provide not only sustainability through efficiency of operations but also the ability to crowd in private sector-led investments.

69. **The sustainability of off-grid investments beyond the life of the project is at the core of project design**. First, the off-grid supply solutions are identified based on a comprehensive geospatial plan with a robust approximation of consumption points and total demand. This plan will be updated over time allowing a regular assessment of economic viability. Second, a contractor will be engaged by the government to design, supply, install and operate the systems, especially for the public facilities. O&M services for will be contracted out to ensure attention to replacement and

repairs of these assets. The MoEWR/MoEM will handover operations of the systems to the ministries of health and education beyond the project period and will ensure capacity is built for these ministries to take care of the system. Technical assistance will be provided to the ministries of health and education under the project to improve their budget discipline for the facilities' operational costs and to identify measures to increase their revenue stream, based on best practices and in collaboration with the World Bank Health and Education projects.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis (if applicable)

70. **Technical.** The activities under the project will not pose any significant technical concerns. All the technologies applied in the project, particularly the generator synchronization, the 132 kV sub-transmission and MV distribution network reinforcement, solar PV Installations and BESS have been widely used in other countries with similar conditions. Specially, the integration of solar PV/BESS into the existing HSDGs system has recently been undertaken by several ESPs in Somaliland under the ESRES-FCDO supported project and thus there is country experience with similar technology.

71. **Economic and Financial.** The economic returns are assessed in a standard cost-benefit analysis. Benefits of components 1 and 2 are based on the economic value of displaced diesel fuel. Under component 3, the social benefits of electrification of health and educational facilities cannot easily be monetized in the absence of reliable health data, as a proxy for willingness-to-pay (WTP) the avoided cost of diesel generation that would provide the equivalent electricity output was applied. Component 4 is excluded since the economic benefits of technical (TA) outcomes are difficult to monetize. The economic analysis shows high returns, a consequence of the unusually high cost of diesel generation, especially in inland areas. The five-year average of diesel price in Mogadishu is $0.81 per liter, and $0.68 per liter as of January 2021, compounded by losses in a dilapidated distribution network of up to 40 percent. Diesel prices in inland regions have averaged from $0.61 per liter to $1.10 (in the Juba region). The economic returns are shown in table 4. The lowest returns are for component 3, but the social benefits of improved health and educational outcomes will exceed the WTP proxy used in the analysis. The present operation of the ESPs is so inefficient, losses are so high, and diesel fuel so expensive that even with the application of a 2.5x multiplier over international price levels the proposed interventions have much higher returns than in most other countries in Africa. Details of the economic and financial analysis are presented in annex 3.

Table 4: Economic Analysis

Component	ERR	NPV US$ million
1A: Generator Synchronization and Automation	47%	52
1B: Subtransmission and Distribution network interconnection in the major load centers	43%	370
2: PV Hybridization and battery storage systems for minigrids	43%	63
3: Stand-alone solar off-grid access to public institutions	19%	42
Project as a whole	39%	549
Including GHG, low SVC	42%	608
Including GHG, high SVC	52%	697

Note: NPV discount rate of 4 percent, 15-year economic project lifetime. ERR = economic rate of return; NPV = net present value; GHG= greenhouse gas; SVC = shadow value of carbon.

72. The GHG accounting is integrated into the economic analysis, based on lifetimes of 15 years (corresponding to typical 15-year PV warranties). Since diesel consumption (and hence GHGs) is a strong function of loading, the savings are based directly on reductions in diesel fuel rather than the usual IFI and Intergovernmental Panel for Climate Change (IPCC) default values for emission factors. Lifetime GHG emission reductions are estimated at 2.4 million tons of CO_2. The low and high valuations stipulated in the World Bank's guidance document increases the economic returns as shown in annex 3.

73. **Financial analysis.** Components 1 and 2 involve ESPs whose financial statements were not available, and thus the impact of the project on the financial condition of the ESPs could not be assessed. However, the approach used to undertake the financial analysis was to capture the expected incremental cash flows with the assumption that the ESPs will purchase the PV generated power. Such a financial assessment is not appropriate for the health center and school SHSs (component 3), which generate no offsetting revenue from users. Real financial returns are somewhat lower than the ERRs (attributable mainly to an 18 percent import duty on CAPEX), but highly profitable to the ESPs. Details are available in annex 3.

74. Impact of climate change on economic returns and assessment of mitigation and adaptation costs. Notwithstanding the high level of uncertainty in the input assumptions, the resilience of the project interventions to severe climate change is high. The worst-case climate change scenario does not threaten the economic viability of the proposed project investments. Details of impact of climate change and adaptation costs are discussed in annex 3.

B. Fiduciary

Financial Management

75. The financial management (FM) assessment and the design of the FM arrangements for this project took into consideration the government public financial management (PFM) systems in the energy sector. In particular, the assessment covered the sector's planning and budgeting approaches, funding flow and banking arrangements, and accounting and internal control frameworks, including payroll controls and the supporting systems—reporting as well as external audit and oversight arrangements. The assessment took into account the extent to which the existing systems are mainstreamed into the country's PFM systems. The FM systems and arrangements will include budgeting, accounting, internal controls, funds flow, financial reporting and internal and external auditing arrangements, FM staffing, risk management, and related policies, procedures, and practices. The objective of the assessment was to ascertain that the FM systems will facilitate the preparation of regular, timely, and reliable financial statements and will support the provision of a complete, true, and fair record of all transactions and balances, safeguard assets, and internal and external auditing arrangements, in line with the World Bank financial management policies and internationally accepted standards. Detailed mitigation measures are provided in Annex 2.

76. **In view of the specific context and operating environment in Somalia, the residual fiduciary risk for the project is assessed as *Substantial***. The Substantial-risk rating is largely attributable to weak institutional and systems capacities at the federal, state, regional, and district levels. The policies, procedures, and legal framework needed to support the sector are under formulation with support from international development partners. In addition, there are (a) deficient human resource capital at national and regional levels; (b) sustainability challenges, as the energy sector is largely managed and funded via out-of-country systems; and (c) inadequate resources to finance the sector in line with the priorities of the government(s).

77. **The project will adopt the use of country systems (UCS) in various aspects of the project's FM, including budgeting, accounting and reporting, banking, and oversight arrangements with the Office of the Auditor General.** This will be supported by technical assistance with clear requirements for knowledge transfer incorporated in the Terms of Reference (ToRs). Similar to other World Bank–supported operations, the External Assistance Fiduciary Section (EAFS) units, established within the Offices of the Accountant General at FGS and Somaliland will be charged with the overall project FM for all projects financed by IDA resources whose performances thus far has been satisfactory. With overall guidance from the Accountant General(s) and the EAFS units, the respective PIUs will continue to provide day-to-day FM oversight of the project. The effectiveness of the EAFS units, alongside other key functional units, will be continuously monitored, while key areas of capacity strengthening will be identified and supported through the project. The existing organizational and functional structure of the EAFS units are expected to be maintained and further strengthened to provide effective FM support to the project.

78. **All project FM transactions will be recognized, captured, recorded, analyzed, summarized, and reported through the governments' financial management information system (MIS).** The EAFS units with support of the respective accountant generals will ensure that (a) all important business and financial processes are adhered to, (b) adequate internal controls and procedures are in place and adequately enforced, (c) unaudited Interim Financial Reports (IFRs) are prepared on a timely basis, (d) all Statements of Expenditures (SOEs) are submitted to the World Bank on a timely basis, (e) project financial statements are prepared on a timely basis and in accordance with international public-sector accounting standards cash-basis, and (f) external audit is completed on time and audit findings and recommendations/issues raised in the management letter are implemented expeditiously.

Procurement

79. Procurement will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers dated November 2020 (Procurement Regulations); the *Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants*, revised July 1, 2016; and the provisions stipulated in the Financing Agreement. Procurement under the project will be carried out according to the arrangements described in annex 2.

80. **Procurement implementation arrangement**. For implementation of the ongoing SEAP, two functional PIUs were established at MoEWR and MoEM. The same PIUs will be utilized for implementation of SESRP. The implementation timelines of SEAP (stipulated to be closed on June 30, 2022) and SESRP are overlapping. The expertise gained and institutional memory will be beneficial for implementation of SESRP. The PIUs are staffed with a dedicated procurement specialist. In both the PIUs, an adequate number of officials dealing with procurement either directly or indirectly have undergone procurement training with focus on the World Bank's procurement regulations. Considering the increased spending envelope for SESRP and the procurement profile, the staff needs timely advice and support in articulating high-value and complex procurement transactions envisaged through SESRP. The World Bank continues to review the capacity requirements and staff turnover and provides need-based refresher trainings periodically, including training to manage the Systematic Tracking of Exchanges in Procurement (STEP) portal.

81. **Project procurement strategy for development (PPSD) and the Procurement Plan (PP).** The borrower has prepared the PPSD and Procurement Plan for the first 18 months with a focus on key procurement activities to select the optimum fit-for-purpose method and market approach.

82. **Systematic tracking of exchanges in procurement.** The World Bank's STEP system will be used to prepare, clear, and update PPs and conduct all procurement transactions for the project. Staff of the PIU have been trained in using STEP.

C. Legal Operational Policies

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

D. Environmental and Social

83. **The project's Environmental and Social Risk Management follows a phased approach starting with basic assessments and then builds incrementally through a sectoral wide assessment commencing in the early phases of project implementation**. The key E&S risks at the project level that will need to be taken into consideration as detailed assessment are carried out during the implementation are security risks, occupation health and safety, labor welfare and working conditions, labor influx, waste management, land acquisition and resettlement, legacy issues around existing sites of generation and distribution network. Given the low capacity at the FGS, FMS, ESPs, local contractors, consultants and other implementing partners, substantial focus will be on building capacity by following a learning by doing approach. Simultaneously, support will be provided under the project to set-up an E&S management system, policies, guidelines etc. to serve in the medium and long term through a capacity building plan.

84. The project has prepared an Environmental and Social Management Framework (ESMF), Stakeholder Engagement Plan (SEP), Draft Security Management Framework, Environmental and Social Commitment Plan, Draft Labour management procedures (LMP), standalone Draft GBV Mitigation Action Plan and draft Resettlement Policy Framework (RPF) and disclosed in country on September 12, 2021[34]. The ESMF includes ToR for Sectoral Environmental and Social Impact Assessment (SESIA), ToR for Capacity Building Plan with activities, timetable, budget and ToR for conducting assessment to confirm the presence of IP/Sub-Saharan Historically Underserved Traditional Local Communities as per ESS7 to (a) determine the applicability of the standard; (b) prepare an IPPF if required.

85. Stakeholder consultation were held on April 28, 2021 (Somaliland) and on May 22, 24 to 26, 2021 for FGS (Somalia). Additional Stakeholder engagements were held from June 15 to 30, 2021. All these have been documented. Once the sub project design is finalized and the sites are identified the PIU will disclose the executive summaries of ESMF, RPF, LMP as well as ESMP, RAPs etc, in the respective FMS and district offices in culturally appropriate manner. Site-specific environmental and social standards instruments such as ESIAs, ESMPs, and/or Resettlement Action Plans will be prepared as required. All ESF instruments shall be reviewed and cleared by the World Bank and publicly disclosed for feedback as per ESS10.

86. The ESMF covers the environmental and social baseline of the project; a review of relevant national policy; a thorough performance evaluation of regulatory frameworks and institutional arrangements; environmental and social

[34] The ESCP, SEP and AESRS have been disclosed on Bank website on September 30, 2021. Other documents are in the approval process for disclosure on World Bank website

risks and impacts and mitigation measures; project coordination and implementation arrangements; capacity building and training; the environmental and social screening process; a generic Environmental and Social Management Plan (ESMP) for distinctive activities of the project, such as sub-transmission and distribution network reconstruction and reinforcement in the major load centers, hybridization and optimization (including battery storage) of existing and greenfield mini grids developments, retrofitting of existing and new public infrastructure facilities with electricity services and support, and TA activities; ToR for the preparation of site-specific Environmental and Social Impact Assessment (ESIA) and ESMP; chance-finds procedures for cultural heritage; and relevant guidelines (such as solar batteries and panels management, a disposal and recycling plan, and environment, health and safety (EHS) general and transmission/distribution guidelines); and ESMF implementation budget.

87. To further assess capacity at sectoral level a Sectoral Environmental and Social Impact Assessment (SESIA) will be undertaken in the early phases of the project implementation. The SESIA will examine environmental and social risks, impacts, and issues associated with the energy sector in Somalia. It will evaluate and compare the impacts against those of alternative options, assess legal and institutional aspects relevant to the risks and impacts, and recommend broad measures to strengthen environmental and social management. The SESIA will pay particular attention to potential cumulative risks and impacts of multiple activities. The findings of SESIA will link to the larger capacity building plan under SOP 2, 3 and regional project like horn of Africa gateway development project.

88. The presence of communities that meet the identification criteria for IP/SSAHUTLCs is yet to be confirmed. Consistent with ESS7, the government shall further analyze the application of ESS 7 based on Consultations with experts and potentially affected groups and will prepare an IPPF if needed. IPPF will include the screening checklist to confirm the presence of this groups and circumstances requiring Free Prior and informed Consent.

89. An Environmental specialist and Social Specialist in the PIUs for E&S risk management have been hired under the project. An E&S Firm has been hired to provide support in preparation of ESMF, Resettlement Policy Framework, SEP, Labor Management Procedures, and GBV Action Plan and provide guidance in early phase of project implementation in the areas of health, safety, labor management, land, resettlement, community. The Owners Engineer will be responsible for preparing site-specific E&S instruments along with the subproject specific design and subsequent supervision. The Business Support services Firm (BSSF), with experience in utility operations, will be hired to support the ESPs in strengthening their technical and institutional capacity in the key functions of electricity utility business. The experts provided by the BSSF will work as advisors paired to the ESP counterparts for a period of two to three years. The BSSF will support and guide the day-to-day sector undertakings over a medium term to reestablish the Somali electricity sector covering both policy, oversight, operations and management. The BSSF support will include coaching and hands-on training of the sector staff covering EHS issues such as: sector governance, development of appropriate regulations and EHS standards in safety, environmental, and social performance obligations for ESPs. The BSSF will support ESPs in enabling E&S capacity, including the preparation of EHS manuals with a focus on the ESPs' operations and maintenance obligations for the facilities financed by the project. An independent monitoring and verification firm will provide independent audits (covering technical, fiduciary and safeguards among others) including assessment of E&S performance of contractors and ESPs against the subproject specific mitigation plans.

90. There are allegations of forced labor risks associated with the polysilicon suppliers. The Borrower will require bidders to provide two declarations: a Forced Labor Performance Declaration (which covers past performance), and a Forced Labor Declaration (which covers future commitments to prevent, monitor and report on any forced labor,

cascading the requirements to their own sub-contractors and suppliers). In addition, the Borrower will include enhanced language on forced labor in the procurement contracts.

Gender

91. **The project preparatory activities, in alignment with the Gender Strategy of the World Bank, and as agreed with the counterparts, included specific gender activities.** A preliminary gender assessment was conducted to assess the main gender gaps in the country and an action plan of activities was developed for the project.

92. **The project's focus in fostering gender equality will be closely monitored during project implementation**. The project results framework includes two intermediate indicators linked to gender: (a) the percentage of women employed in the energy sector and (b) Completion of the Diagnostic Gender Assessment. The project will collect sex-disaggregated data where applicable. Additional details regarding the gender analysis, actions, monitoring and evaluation, and the project gender action plan are provided in annex 4.

Citizen Engagement

93. Stakeholder consultations have been undertaken as part of the project preparation and will continue during project implementation. Combined with a broader communication awareness, these consultations will provide an opportunity to interact with the wider public through focus group discussions to understand the experiences people and businesses have with electricity services and their expectations about their improvements. The stakeholder consultations include women-only sessions, scheduled to ensure that women understand the scope of the project and how it will impact their access and usage of the electrical services. The consultative sessions also include owners and managers of women-owned small and medium enterprises in order to understand their experiences and how availability of reliable electricity could contribute to increased productivity and income-generating opportunities. Synergies with relevant projects, such as the Shock Responsive Safety Net for Human Capital Project (P171346), have informed the project design aimed at maximizing impacts on gender equality.

94. The project will establish a citizens' feedback mechanism and grievance redress system, which will look at beneficiary satisfaction, and other citizen engagement tools. The project GRM will build on what was created for the Somali Electricity Access Project (See separate SEP). A specific consultation session on the E&S Risk Assessment and Action Plan and GRM will be set up to complete the SEP. A Feedback and Grievance Redressal System that will have various contact channels is envisioned for SESRP. Noting the indirect benefit of component 1 to citizens/households due to reduction of inefficiencies in the network, the GRM will include mechanisms for citizens or households to be able to register their feedback or complaint towards the performance of the ESPs, their existing supply situation, billings, etc. The GRM has to be in place by the time the RAPs and ESIAs are prepared, until completion of all construction activities and beyond until the defect liability period ends. A separate mechanism is developed to address worker grievances. Grievances related to the actions of contractors are resolved by the contractors. Under the project, project beneficiaries' satisfaction with activities will be tracked by beneficiaries that feel project investments reflected their needs (%), and satisfaction of enterprises in beneficiaries survey as part of overall project monitoring.

95. The GRM will be a project wide GRM that will also be available for use by PAPs. The GRM will work interconnectedly with local level actors at the FMS, community, District, and Municipal levels. This is to ensure that all measures are taken to address the grievance. The GRM will be housed at both MoEWR (FGS); and the MoEM (Somaliland) and provide access to SESRP stakeholders and contractors to register complaints received at sub-project

level or the field. At the Municipality /Local Government level, a Grievance Redress Committee (GRC) shall be established and composed of local leaders, municipal representatives, the project, community-based organizations, Legal Aid and law enforcement agencies. The GRC will be headed through a consensual appointment done with affected communities, and steps will be taken to ensure that all grievances are properly documented and transferred to the digital platform for tracking of resolution. The PAPs may also make complaints directly to the project wide GRM through the digital platform either by calling, sending text, whatsapp etc. The project will identify an NGO GBV service provider to set up and ethically manage SEA/SH complaints. The detailed structure of the GRM for the project workers has been described in the LMP and will be detailed in the project operations manual.

96. The beneficiaries will be able to register their feedback or complaint toward the performance of the ESPs and in general electricity services delivery. The project will conduct independent surveys to track beneficiaries' feedback on their perception and experience of the activities implemented under the project, which will be disaggregated by gender and geographical area. The consultation processes will be an ongoing activity throughout the project cycle to ensure that stakeholders are fully engaged, especially the vulnerable and disadvantaged groups. In addition, to prevent and respond to GBV during project implementation, measures will be taken to sensitize and train the PIU, implementing agencies (IAs), and contractors against GBV. The final beneficiaries of the project, mainly the consumers of electricity services in the country are unlikely to be aware of the new technologies being presented and will benefit from information about the services, explanation about how the services can be accessed, and the opportunity to interact with service providers to share their feedback and concerns. It will be expected that the representative of consumer groups will sit in the ESWG to voice the concerns of consumers, as well as help service providers better understand the needs and concerns of their customers. The citizen engagement program will employ a variety of messaging tools and personal interaction to reach various audiences while ensuring opportunities for two-way dialogue. Specifically, the beneficiary ESPs, will be required to undertake annual Consumer Satisfaction Surveys, the results of which and the actions thereof shall be publicly disclosed.

Climate and Disaster Risks

97. The screening (providing B rating) considered the various locations of the project interventions as well as the types of infrastructure to be constructed, including those that may be vulnerable to various climatic hazards. The screening has confirmed that Somalia is highly prone to cyclical floods and droughts. Short- and long-term climate change and disaster risks that could potentially affect the sustainability of the project outputs and outcomes mainly include temperature increases, floods, and sandstorms. The temperature rise is not expected to have an impact on the performance of the facilities to be installed under the project, as the associated equipment is designed to operate under a wide temperature range. Sandstorms and dust accumulation might affect the network facilities (lines, solar PV panels, and the BESS equipment). However, the mechanical and electrical design is robust enough to withstand the impacts. The site selection process for the solar PV panels and electricity networks will try to avoid flood-prone areas wherever possible. It will include developing equipment and construction designs, specifically use of steel and concrete poles with concrete foundations, to withstand flashfloods. For the equipment that maybe prone to dust, such as the control and BESS equipment, the engineering specifications will require that the equipment is installed in dust-proof cabins. In addition, the O&M will include routine monitoring and, where required, cleaning of the solar panels to avoid dust cumulations. Therefore, the risks will be addressed through proper design, siting, operation, and maintenance of the infrastructure assets.

Climate Co-Benefits.

98. This project tackles climate change both from a mitigation and an adaptation perspective. By reinforcing the grid and building a more efficient and resilient network, the project will reduce technical losses in the grid and make it more climate resilient. In addition, by supporting the installation of BESS and solar PV systems, the project will optimize renewable energy generation and reduce GHG emissions. Finally, by increasing access to electricity services in communities highly vulnerable to climate change, the project will contribute to increased resilience. Climate co-benefits have been assessed at US$73.31million (48.88 percent) and the project also has potential for increasing climate co-benefits. Several project activities will generate climate change mitigation and adaptation co-benefits:

a. *Component 1* activities (generator synchronization and the sub-transmission and distribution network reconstruction and capacity reinforcement will result in a reduction in technical losses, estimated at 90 GWh energy savings annually in addition to reduced generator fuel consumption from wet-stacking estimated at about 40 million liters of diesel annually. Both the reduction in losses and reduced fuel consumption are estimated to lead to reduced GHG emissions equivalent to about 106 $ktCO_2$ annually.
b. *Component 2* (Renewable Energy Generation Optimization) will support installation of renewable energy capacity (both solar PV and BESS) equivalent to about 18 MW, equivalent to about 25 $ktonCO_2$ of avoided GHG emission annualy.
c. *Component 3* will support installation of solar PV systems with a total capacity of around 5.1 MWp, leading to about 16 $ktCO_2$ of avoided GHG emissions per year.
d. *Component 4* will contribute to climate mitigation as the activities related to capacity building and institutional strengthening will support institutional policies that will enhance increased uptake of renewable energy (through the prioritization under the Sector Least-Cost Development Plan and the associated wind resource site-specific measurements and geothermal resource mapping) and enable the sector's energy policy, which prioritizes renewable energy–based generation, given the country's comparative advantage. Further, the component will help establish a regulatory regime that will improve ESPs efficiency and lower their operational cost.

V. GRIEVANCE REDRESS SERVICES

99. Communities and individuals who believe that they are adversely affected by a World Bank–supported project may submit complaints to existing project-level grievance redress mechanisms or the bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project-affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of World Bank noncompliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention and 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/en/projects-operations/products-and-services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit *www.inspectionpanel.org*.

VI. KEY RISKS

100. **The overall risk of the project is considered *"substantial"*.** There are several risks to this project, including a fluid political and security situation, poor sector governance, and lack of an enabling institutional and legal framework. While

efforts have been made toward political settlement, reconciling the country, and bringing peace, security remains a challenge, especially in some regions in the south and central Somalia. Sector institutions continue to face capacity constraints and operate within a policy and regulatory vacuum. These challenges continue to create an extremely challenging operating environment. However, the risks of inaction outweigh these challenges, and thus the mitigation measures to be supported by the project. With these measures, such as provision of technical assistance to enhance the sector capacity and provide project implementation support, the overall risk rating for this project has been rated as substantial.

101. **Political and Governance (High).** Relations among FGS, FMS, and Somaliland could impact the project implementation. Further, the current uncertainty regarding FGS elections could heighten existing tensions in Somalia and shift the development priorities. Overall, the adequacy of political commitment and capacity to create partnerships to strengthen institutions and set up an enabling regulatory environment may also undermine the success of the project. There is also a potential risk regarding contestation around the amounts and project locations. In addition, the lack of FGS-GoSL agreement for IDA funds flow is a risk and may delay project implementation. Mitigation measures include coordination and working closely with the various key stakeholders such as the FGS, FMS, GoSL, and the ESP agencies during project implementation. The project activities are prioritized as per the assessments of the Somalia Electricity Power Masterplan for the targeted major load centers and the ongoing geospatial analysis with regard to the targeted public institutions. Discussions are underway between the World Bank, FGS and GoSL to establish IDA funds flow. Despite the mitigation measures, the residual risk is rated *high* given the fact the political uncertainties are beyond the control of the project.

102. **Macroeconomic (Substantial).** The residual risk is rated *Substantial*, given the fact that the sector operations have been mainly financed by the private sector (the ESPs). A key concern is the impact of the COVID-19 on the ESPs operations. Over the past year, the COVID-19 pandemic has caused an unprecedented global economic and social crisis, significantly affecting all aspects of life. The whole range of consequences for the energy sector is yet to be revealed and is difficult to predict. However, it is already clear that demand for energy resources has dropped, and nonpayment of utilities bills by consumers will have a detrimental effect along the supply chain. Another concern is the impact of the reduced demand on the ESPs' cash flows and the spillover effect this has on the operation's sustainability.

103. **Institutional Capacity for Implementation (Substantial).** Low capacity within the implementing agencies (ministries of energy) and ESPs risks undermining the ability to effectively prepare and implement the project in a timely and effective manner. To mitigate this risk, the project will use the existing PIUs established under the ongoing World Bank–financed SEAP project (P165497). Further, lack of adequate capacity related to implementation will be mitigated by having an OE/supervision consultant that will support the PIUs in the detailed activity design, procurement, and contracts management. The project also includes capacity-building activities to establish effective management of the sector activities. In addition, the project proposes to strengthen budget allocation for the provision of electricity to health and education facilities after the lifetime of the project. While it provides TA activities to increase the capacity of the line ministries and of the revenue stream from the facilities to contribute to the operating expenses, it remains a residual risk that the SHSs will not be adequately maintained after the project.

104. **Fiduciary (Substantial).** The financial management and procurement environment in Somalia remain challenging, with some potential levels of mismanagement, fraud, lack of transparency, and corruption. Although anticorruption and public-sector regulations are in place, problems persist, contributing to low levels of trust in government institutions. Mitigation measures were detailed following the findings of the Financial Management and Procurement Assessments

and will be included in the Project Operations Manual and the PPSD. Further, the project builds on the lessons learned under the ongoing SEAP, such as retaining the SEAP PIU-dedicated procurement and FM specialists who have been trained under the SEAP. In addition, on-the-job fiduciary training and World Bank's periodic reviews and implementation support will regularly be undertaken to help in mitigating these risks.

105. **Environmental and Social (High)**. The environmental rating is based on the complexity of activities proposed, coverage of the project, as well as its possible impacts. First, the electricity supply industry in Somalia is dominated by private players with poor safety records. Second, the government does not own generation assets and has small leverage and low capacity to oversee the Environmental risks of the project. Third, there is little or no formal regulation or codes of standards of practice and mechanism to vet and enforce electricity services quality, health and safety standards. The potential environmental risks include (a) management of environmental and social risks and impacts of the Associated Facilities, such as ESP generation facilities under component 1 and 2 activities (b) disposal and management of liquid and solid waste, such as spoils metals, cables, capacitor, wood, glass, and packaging materials under component 1 ,2 and 3 activities; (c) disposal and management of hazardous wastes such as polychlorinated biphenyls (PCBs) from older imported transformers and capacitors in use by ESPs, transformer parts and oils, certain amount of heavy metals, used and damaged solar panels, and batteries; under component 1, 2 and 3 (d) soil erosion and degradation; (e) fauna and flora disturbance leading to loss of habitats due to land clearance; under component 1 activities (f) dust and noise; (g) contamination and degradation of soil and water; (h) health and safety of employees and communities including those associated with operation of vehicles, plant and equipment, working at height, contaminations associated with improper handling of e-wastes, electrocution and aesthetic, and resource use (water and building materials for construction camps) in areas of less availability. The potential project risks associated with the disposal and management of hazardous wastes will be more aggravated due to limited capacity on disposal, recycling, and management of non-biodegradable hazardous wastes from electrical equipment; damaged or leftover solar panels and used or damaged batteries; and limited knowledge and capacity in O&M of these new energy technologies, including availability and affordability of parts. These risks and impacts are expected to be managed in accordance with the World Bank environmental, health, and safety guidelines and the relevant requirements of Environmental and Social Standards ESS1, ESS2, ESS3, ESS4, and ESS6. Key social risks include: (a) ensuring security for project operations and associated workers, (b) potential land acquisition required for the installation of 132kV sub-transmission network and associated substations, medium voltage line (<33kV) corridors and possible expansion of existing and green field minigrids and Distribution network, (c) forced displacement of IDPs is said to be rampant especially in urban centers such as Mogadishu, Hargeisa and Garowe and may be carried out in anticipation of project investment (d) past issues around land and unsettled/multiple claims with the existing generation sites occupied by the ESPs and the distribution network (e) systemic weakness in the capacity of implementing agencies to identify, understand and prevent adverse environmental and social impacts of the project, (f) fragility, conflict, and violence; (g) vulnerability and social exclusion; (h) spatial dynamics linked to urban growth and rural poverty; (i) social impacts of climate-related risks and environmental degradation (j) Potential establishment of workers camp may exacerbate risks associated with gender-based violence (GBV) or sexual abuse and exploitation (SAE) sexual exploitation and abuse, and other forms of GBV. Currently GBV risk for the project has been assessed to be high, and a GBV action plan has been prepared. All E&S risk mitigation measures have been detailed in the appropriate ESF instruments prepared in line with ESS1, 2, 4, 5, 7 and 10 and the ESCP.

106. At project feasibility and design stage, special attention would be required to overtly avoid and minimize land acquisition. Design alternatives will be explored such as underground/tunneling routing for the transmission and distribution network and selection of poles and towers with minimal footprints. The project E&S screening will involve

current use of land for residential/livelihood purposes, land disputes and claims. Particularly for components 2 and 3 activities, the screening will be used to ascertain encumbrance free availability of land as part of the selection criteria and avoid any form of physical or economic displacement. In exceptional situations a RAP may be prepared for settlement of past claims and compensation purposes and agreed upon for the facility to be selected for investment under the project. For component 1, the availability of land and an agreement on Resettlement Action Plan in line with ESS5 will be a key decision-making criteria for construction activities. Compounded by gaps in legal and regulatory frameworks, land appropriation and asset valuation will be challenging. Given the government's own budget situation, the project would require making an exceptional provision for payments of land and resettlement compensation, which will need to be reviewed as sub-projects are prepared.

107. Regarding the risk of forced labor, under Environmental and Social Standard 2 (ESS2), where there is a significant risk of forced labor related to primary supply workers, the Borrower requires the primary supplier to identify those risks and if forced labor cases are identified, the Borrower will require the primary supplier to take appropriate steps to remedy them. Ultimately, where remedy is not possible, the Borrower will, within a reasonable period, shift the project's primary suppliers to suppliers that can demonstrate that they are meeting the relevant requirements of ESS2. Prior to beginning the procurement process, the Borrower will undertake market analysis to identify the possible sellers of solar panels to the project. The bidding documents will emphasize forced labor risks in solar panels and components and will require that sellers of solar panels to the project will not engage or employ any forced labor among their work force. Bidders will be required to provide two declarations: a Forced Labor Performance Declaration (which covers past performance), and a Forced Labor Declaration (which covers future commitments to prevent, monitor and report on any forced labor, cascading the requirements to their own sub-contractors and suppliers). In addition, enhanced language on forced labor will be included in the procurement contracts. The Bank will prior review procurements of solar panels and components to ensure that enhanced provisions are used by the Borrower.

Other risks (High)

108. **Security Situation Risk (High).** Much of Somalia remains in conflict, which affects access to the project sites and insecurity for staff, of both government agencies and contractors. Given that the SESRP will be implemented across a diverse and contested geographical space, concrete threat vectors will require in-depth security risks assessments (SRA) to ensure the safety of Project workers, contractors and local communities. A security risk management framework to ensure adequate security risk management, emergency responses and duty of care for project workers, project-affected parties and contractors has been prepared. The framework will guide preparation of Project-wide Security Management Plan (SMP). In addition to flexibility with regard to the selection of the project sites subject to the security situation, the project implementation will consider contingency plans and require the contractors to put in place standard operating procedures to undertake the project activities in case of restricted sites' access. Specifically, the project component design offers flexibility to undertake the activities in areas that are of low security risk and, when required, to select new sites.

109. **COVID-19 Pandemic (Substantial).** While all the possible impacts are yet foreseeable and quantifiable, the increased vaccination availability outlook will enable the resumption of travel and thus reduce risk with regard to the commencement of construction works and delays in imports of construction materials. The project will also address the growing need to fight COVID-19 as well as other diseases by making reliable electricity supply available to health institutions and by using BESS to reduce the cost of operations (fuel supply).

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY: Somalia
Somali Electricity Sector Recovery Project

Project Development Objectives(s)

The Project Development Objective is to increase access to lower cost and cleaner electricity supply in project areas and to reestablish the electricity supply industry.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets			End Target
			1	2	3	
Increase access to lower cost and cleaner electricity, re-establish the electricity supply industry						
Increase in electricity supply (Megawatt hour(MWh))		0.00	0.00	41,000.00	237,000.00	237,000.00
Generation capacity of energy constructed or rehabilitated (CRI, Megawatt)		0.00	0.00	6.00	23.00	23.00
Renewable energy generation capacity (other than hydropower) constructed under the project (CRI, Megawatt)		0.00	0.00	0.00	14.00	23.00
Annual GHG avoided (Metric ton)		0.00	0.00	0.00	181,000.00	604,000.00

Indicator Name	PBC	Baseline	Intermediate Targets			End Target
			1	2	3	
Decrease in tariffs under the project (Percentage)		0.00	0.00	10.00	30.00	30.00
Establishment of the Electricity Supply Industry institutions with clear roles and responsibilities (Yes/No)		No	No	Yes	Yes	Yes

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets			End Target
			1	2	3	
Subtransmission, distribution network reconstruction, reinforcement in Mogadishu, Hargeisa						
Distribution lines constructed or rehabilitated (Kilometers)		0.00	0.00	99.00	331.00	331.00
Sub-transmission lines constructed under the project (Kilometers)		0.00	0.00	16.00	52.00	52.00
Generators synchronized (Megawatt)		0.00	0.00	15.00	48.00	48.00
Technical loss reduction (Percentage)		40.00	40.00	40.00	32.00	32.00
Number of people benefitting from improved electricity service delivery under component 1 (Number)		0.00	0.00	945,000.00	3,150,000.00	3,150,000.00
Hybridization and Battery Storage Systems for Minigrids						

Indicator Name	PBC	Baseline	Intermediate Targets			End Target
			1	2	3	
Generation capacity of energy constructed or rehabilitated (CRI, Megawatt)		0.00	0.00	5.00	18.00	18.00
Renewable energy generation capacity (other than hydropower) constructed under the project (CRI, Megawatt)		0.00	0.00	2.00	6.00	18.00
Capacity of solar PV installed (Megawatt)		0.00	0.00	4.00	7.00	14.00
Capacity of BESS installed (Megawatt)		0.00	0.00	1.00	4.00	4.00
Number of people to benefit from improved electricity service delivery under component 2 (Number)		0.00	0.00	380,000.00	2,564,000.00	2,564,000.00
Stand-alone solar off-grid access to public institutions (Health and Education)						
Health facilities connected under the project (Number)		0.00	0.00	30.00	205.00	205.00
Education facilities connected under the project (Number)		0.00	0.00	50.00	380.00	380.00
Number of people benefitting from improved electricity service delivery through health and educational facilities (Number)		0.00	0.00	360,000.00	2,565,000.00	2,565,000.00
Generation capacity of energy constructed or rehabilitated (CRI, Megawatt)		0.00	0.00	1.00	5.00	5.00
Renewable energy generation capacity (other than		0.00	0.00	1.00	3.00	5.00

Indicator Name	PBC	Baseline	Intermediate Targets			End Target
			1	2	3	
hydropower) constructed under the project (CRI, Megawatt)						
Institutional Development and Capacity Building						
Establishment of the Somaliland Energy Regulatory Commission and the FGS National Electricity Authority (Yes/No)		No	No	Yes	Yes	Yes
Adoption of secondary legislation stemming from the Electricity Act (Yes/No)		No	No	Yes	Yes	Yes
Adoption of sector integrated Least-Cost Plan (Yes/No)		No	Yes	Yes	Yes	Yes
Completion of the detailed Diagnostic Gender Assessment (Yes/No)		No	Yes	Yes	Yes	Yes
Increase in women's employment in the energy sector (Percentage)		0.00	0.00	0.00	15.00	20.00
Beneficiaries that feel project investments reflected their needs (%) (Percentage)		0.00	0.00	10.00	50.00	50.00
Satisfaction of enterprises in beneficiaries survey (Percentage)		0.00	0.00	10.00	50.00	50.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Increase in electricity supply	The indicator will track the additional electricity supply provided as a result a) technical loss reduction and synchronization under component 1; b) off-grid solar generation from component 3	Quarterly year 3, 4, 5	Implementation progress reports	ESPs asset register, SHS installation reports	MoEWR, MOEM, ESPs
Generation capacity of energy constructed or rehabilitated		Quarterly year 3, 4, 5	Implementation progress reports	ESPs asset register, contractors reports, SHS installation reports	MoEWR, MOEM, ESPs
Renewable energy generation capacity (other than hydropower) constructed under the project		Quarterly	Implementation progress reports	ESPs asset register, contractors reports, SHS installation reports	MoEWR, MOEM, ESPs
Annual GHG avoided	The indicator will track the reduction in GHG emissions resulting from improved efficiency of ESPs operations and establishment of renewable generation replacing diesel based one.	Quarterly year 3, 4, 5	Implementation progress reports	ESPs customer database, SHS installation reports	MoEWR, MOEM
Decrease in tariffs under the project	The indicator will track the decrease in the participating ESPs tariffs due to project	Quarterly	Implementation progress reports	ESPs tariffs	ESPs, MoEWR, MoEM

	intervention under Component 2.				
Establishment of the Electricity Supply Industry institutions with clear roles and responsibilities	The indicator will track the reestablishment of the sector institutions with clear mandates. Key milestones will include (a) Adaption of a new ESI Institutional Organization structure; (ii) Establishment of the Somaliland Energy Regulatory Commission and the FGS National Electricity Authority; (iii) Enactment of FGS Electricity Law/Act, and (iv) Licenses issued for generation, transmission and distribution operations.	Annual	Implementation progress reports, Sector regulations	The achievement of the indicator will be tracked by: (i) Adoption of a new ESI Institutional Organizational structure; (ii) Establishment of the Somaliland Energy Regulatory Commission and the FGS National Electricity Authority and; Number of Licenses issued for generation, transmission and distribution operations (Baseline 0; Target 10).	MoEWR, MOEM

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Distribution lines constructed or rehabilitated	The indicator will track progress in the length of distribution network	Quarterly year 3, 4, 5.	Implementation progress reports	ESPs asset register/OE reports	MoEWR, MOEM, ESPs

	rehabilitation and extension.				
Sub-transmission lines constructed under the project	The indicator will track progress in the establishment of the sub-transmission network in the country.	Quarterly year 3, 4, 5	Implementation progress reports	ESPs asset register/OE reports	MoEWR, MOEM, ESPs
Generators synchronized	The indicator will track the progress in the synchronization of existing generators improving their efficiency in utilization of available installed capacity.	Quarterly year 3, 4, 5	Implementation progress reports	ESPs asset register/OE reports	MoEWR, MOEM, ESPs
Technical loss reduction	This indicator will track the reduction in technical losses for ESPs in the program areas resulting from distribution network interconnection and rehabilitation.	Year 5	Implementation progress reports	ESPs database (from total generation and total electricity delivered)	MoEWR, MOEM, ESPs
Number of people benefitting from improved electricity service delivery under component 1	This indicator will track the number of people benefitting from improved electricity service delivery	Year 3 and Year 5	Implementation progress reports	ESPs customer database	MoEWR, MOEM, ESPs
Generation capacity of energy constructed or rehabilitated		Year 3, 4, 5	Implementation progress reports	ESPs asset register/contractor reports	MoEWR, MOEM, ESPs
Renewable energy generation capacity (other than hydropower)		Quarterly year 3, 4, 5	Implementation progress	ESPs asset register/contractor	MoEWR, MOEM, ESPs

constructed under the project			reports	reports	
Capacity of solar PV installed	The indicator will track the installed PV capacity in the program areas	Quarterly year 3, 4, 5	Implementation progress reports	ESPs asset register/contractor reports	MoEWR, MOEM, ESPs
Capacity of BESS installed	The indicator will track the installed BESS capacity in the program areas	Quarterly year 3,4,5	Implementation progress reports	ESPs asset register/contractor reports	MoEWR, MOEM, ESPs
Number of people to benefit from improved electricity service delivery under component 2	This indicator will track the number of people benefitting from improved electricity service delivery	Quarterly year 3,4,5	Implementation progress reports	ESPs asset register/contractor reports	MoEWR, MOEM, ESPs
Health facilities connected under the project	The indicator will track the number of health facilities provided with SHS connectivity under the project	Quarterly year 3,4,5	Implementation progress reports	SHS installation reports	MoEWR, MOEM
Education facilities connected under the project	the indicator will track the number of health facilities provided with SHS connectivity under the project	Quarterly year 3,4,5	Implementation progress reports	SHS installation reports	MoEWR, MOEM
Number of people benefitting from improved electricity service delivery through health and educational facilities	This indicator will track the number of people benefitting from improved electricity service delivery through health and educational facilities	Quarterly year 3,4,5	Implementation progress reports	Reports from connected health facilities (number of patients served) and educational facilities (number of scholars)	MoEWR, MOEM

Generation capacity of energy constructed or rehabilitated		Quarterly year 3,4,5	Implementation progress reports	SHS installation reports	MoEWR, MOEM
Renewable energy generation capacity (other than hydropower) constructed under the project		Quarterly year 3,4,5	Implementation progress reports	SHS installation reports	MoEWR, MOEM
Establishment of the Somaliland Energy Regulatory Commission and the FGS National Electricity Authority	The indicator will track the establishment and operationalization of sector regulatory authorities	Annual - expected operationalization of sector regulatory authorities by end of year 2	Implementation progress reports	National gazzette and other relevant government documents	MoEWR, MoEM
Adoption of secondary legislation stemming from the Electricity Act	The indicator will track the adoption of the secondary legislation for sector operations	Annual	Implementation progress report	Gazette and other relevant national documents	MoEWR, MoEM
Adoption of sector integrated Least-Cost Plan	The indicator will track the adoption of the fundamental sector planning instruments for sector recovery and development	Annual	Implementation progress reports	Report publication	MoEWR, MoEM

Completion of the detailed Diagnostic Gender Assessment	The indicator will track the completion of the Gender Diagnostic assessment	Annual	Implementation progress report	Publication of the assessment online	MoEWR, MoEM
Increase in women's employment in the energy sector	The indicator will track progress in the female workforce participation in energy sector institutions in the country as supported by project activities.	Quarterly	Implementation progress reports	through an ad-hoc establishment of a Women in Energy Tracking System to track women engineers enrolled in the incubator financed under the project. The system will track applications, admission, enrollment, performance, graduation and eventually placement and retention of each incubator participant in the energy sector. A feedback mechanism will also be established to collect feedback on the effectiveness of and how to improve the incubator program from implementers and users of the incubator. The data will be	MoEWR, MoEM

				collected throughout the program though user surveys, focus groups and other methods	
Beneficiaries that feel project investments reflected their needs (%)	This is a Citizen Engagement indicator which will measure the satisfaction of project beneficiaries (ESPs customers under Component 1 and 2, beneficiaries of improved services of health and education facilities) with project activities.	In year 3 and 5 of project implement ation.	Survey reports. Baseline established under year 1, survey reports in year 3 and 5	Phone-based surveys will be used to establish a baseline and conduct the surveys to gather feedback from beneficiaries	MoEWR, MoEM, ESPs
Satisfaction of enterprises in beneficiaries survey	This is a Citizen Engagement indicator which will measure the satisfaction of enterprises beneficiaries of project activities under Component 1 and 2.	In year 3 and 5 of project implement ation.	Survey reports. Base line established under year 1, survey reports in year 3 and 5	Phone-based surveys will be used to establish a baseline and conduct the surveys to gather feedback from beneficiaries for e.g. improved sales and profits, businesses cost reduction, job expansion.	MoEWR, MoEM, ESPs

ANNEX 1: Description of Series of Projects (SOP)

SERIES OF PROJECTS

1. **The Somali Electricity Sector Recovery Project (SESRP) has been conceptualized as the first of a series of three projects: (a) electricity sector recovery, (b) electricity sector development, and (c) electrification scale-up.** The SOP Development Objective is to increase access to lower cost and cleaner electricity supply in the Program Areas. The SOP vision has four themes: (a) infrastructure development, (b) renewable energy generation, (c) electricity supply to public institutions, and (d) sector capacity enhancement. These themes aim to achieve the following outcomes:

I. Increased access to lower cost electricity supply from diverse energy resources especially from renewable energy resources for climate change mitigation; and increased access to electricity services.
II. Improved access to functional health and education services.
III. Sector institutional, legal, and regulatory enabling environment for sustained sector operations, including enhancing both the public and private capacity to manage and operate the sector.

2. **The SOP themes are transformed into four pillars (or categories of interventions).** These four pillars define the program framework and capture the activities necessary to achieve the key results and outcomes. Table 1.1 provides a summary of the four pillars.

3. The project and SOP will support the country in achieving the objectives set out in the PSMP, which, among others, include (a) development of an integrated distribution infrastructure connecting existing isolated systems and development of a transmission backbone to interconnect the distribution grid, (b) development of national renewable resources for cheaper endogenous generation capacity, (c) use of solar off-grid solutions to accelerate access provision, (d) leveraging of opportunities for power trading with neighboring countries in the Horn of Africa and the broader Eastern Africa Power Pool, and (e) establishment of an enabling regulatory and institutional framework with adequate capacity to undertake its mandate.

Table 1.1 SOP Pillars – Categories of Interventions

SOP PILLARS	A. Infrastructure development	B. Renewable energy generation	C. Service delivery to social institutions	D. Sector capacity enhancement
Description	Establishment of an interconnected power infrastructure from the existing fragmented network	Hybridization of existing diesel generation; greenfield mini-grid development	Electricity access to priority social institutions with greenfield hybrid mini-grids and stand-alone solar PV systems	Capacity building for institutional strengthening; TA for sector governance, policy regulation, planning; TA for service providers operational and commercial efficiency
Outcome	Increased electricity supply, decrease in network losses and cost of power, readiness for power trade, electricity access	Increased electricity supply, decrease in network losses and cost of power, electricity access, climate change mitigation	Improved social service delivery, improved livelihoods, climate change mitigation	Re-establishment of the Electricity Sector Industry for sector management and development, improved sector gender equality
Outputs	ESPs synchronization and automation of generation capacity; establishment and integration of transmission and sub-transmission infrastructure; reinforcement, expansion, and integration of distribution network, tariff reduction, last mile connectivity	Installation of Battery Energy Storage Systems (BESS) and renewable energy capacity, last mile connectivity	Installation of Battery Energy Storage Systems (BESS) and renewable energy capacity for health facilities, schools, water points, last mile connectivity	Business support services, adequate staffing, establishment of Regulatory Authorities with operational capacity, adoption of secondary legislation for sector operating rules, adoption of sector integrated Least Cost Plan, ESPs' business development support services, incubator sector for gender equality
Phase I	Mogadishu and Hargeisa	Select ESPs nation-wide	Selected facilities nation-wide	Institutional strengthening for sector recovery
Phase II	Scale-up to additional load centers + establishment of sub-regional transmission backbone connecting the strengthened load centers	Greenfield mini-grids piloting, hybridization scale-up in selected sites	Selected facilities nation-wide	Institutional strengthening for sector development
Phase IIII	Grid connectivity	Nation-wide scale-up in selected sites	Nation-wide scale-up in selected sites	Institutional strengthening for access scale-up

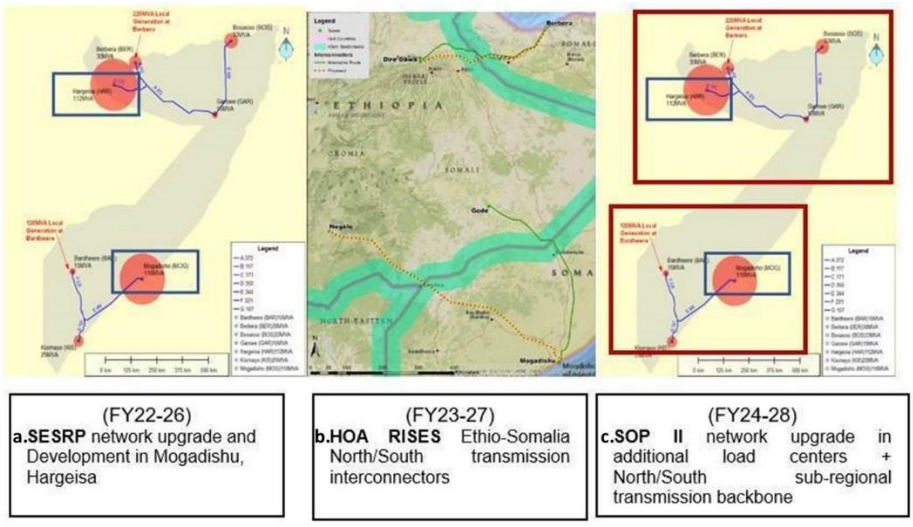
4. **SOP 1 - electricity sector recovery -** will focus on (a) distribution network reconstruction and reinforcement in the major load centers of Mogadishu and Hargeisa, (b) renewable energy generation through the hybridization (through SPV and BESS) of selected HSDGs based generation so as to optimize and scale up existing ESP generation infrastructure, (c) electricity access to existing public facilities (health and education) in rural areas to enhance public social services delivery, and (d) strengthening the capacity of sector institutions (both public and private) so as to set up an enabling institutional and regulatory environment for the sector. The activities for this SOP are described in the "Project Description" section.

5. This project is expected to support the development of the sector's institutional and physical infrastructure in the country and harness the benefits of regional integration and trade in the Horn of Africa. This first project will focus on sector institutional building, the establishment of an ESI with clear mandates and responsibilities for sector institutions, and an enabling regulatory framework for sector operations. By supporting infrastructure investments and improved operational efficiencies of the ESPs, the project will also set the stage for increased private sector participation in the country, supported by IFC. It will also establish the physical network fundamentals for connecting Mogadishu and Hargeisa to neighboring countries (Ethiopia), which are key loads for the two priority interconnectors identified by the country under the Horn of Africa Initiative(i) Ethiopia- Berbera through Hargeisa and (ii) Ethiopia-Mogadishu. These two 220kV transmission interconnectors could be established (total financing envelope of US$450 million) under the second phase of the HOA RISES project SOP (Board approval expected in FY23). The Feasibility Studies for the two interconnectors and the ESIA will be financed through the PPA established under Component 3 of the first phase of the HOA RISES project In

the absence of these investments in Mogadishu and Hargeisa, investments for the establishment of the interconnectors would not be technically possible, interconnectors will also leapfrog the establishment of some segments of the transmission backbone in Somalia, leveraging regional IDA funds and rallying developing partner cofinancing.

6. **SOP 2 - Electricity Sector Development -** will scale up activities to additional selected load centers and establish the subregional transmission backbone infrastructure in the north and in the south of Somalia, thus creating bulk supply points. This would allow the various major load centers (the interconnected subtransmission and distribution networks) to have access to bulk power supply, including from large-scale grid-connected generation and possibly imports from neighboring countries. Detailed activities and the associated feasibility studies for Phase 2 will be conducted under phase 1 and under the Somalia–Horn of Africa Infrastructure Integration Project (P173119). SOP 2 will continue providing support to renewable energy generation through hybridization of existing minigrids and will pilot the development of greenfield minigrids; it will also scale up electricity access to social institutions. In addition, SOP 2 will further support sector capacity and institutional planning for a large-scale electrification program and further develop an enabling environment for private sector investments. Furthermore, the upgrade of other countries' main load centers, including Berbera and the establishment of the subregional transmission backbone, will ensure that possible power imports and additional supply can be dispatched at the national level and that the benefits of additional, lower-cost, and clean energy supply do power the socioeconomic recovery of the country, including ports and so forth. Figure 1.1 below depicts the vision for the phased approach of national and regional activities.

Figure 1.1 Somali Energy Sector Recovery Project SOP and Proposed HoA RISES Sequence and Complementary



Note: SERSP = Somali Electricity Sector Recovery Project; HOA RISES = Horn of Africa Regional Integration for Sustainable Energy Supply.

7. **SOP 3 - Electrification scale-up -** will scale up the last-mile electrification agenda, based on the experience acquired and the enabling environment established by the previous phases. SOP 3 will focus on (a) grid connectivity in the main load centers upgraded, (b) scale-up of greenfield and brownfield hybrid minigrids, based

on the experience acquired under SOP I and SOP 2, and (c) electricity access to rural communities and social facilities with off-grid solar. Sector enhancement activities under SOP 1 and SOP 2 will establish the sector planning and operational capacity for the implementation of a nation-wide electrification rollout program, rallying both private sector investors and development partners to the electrification agenda.

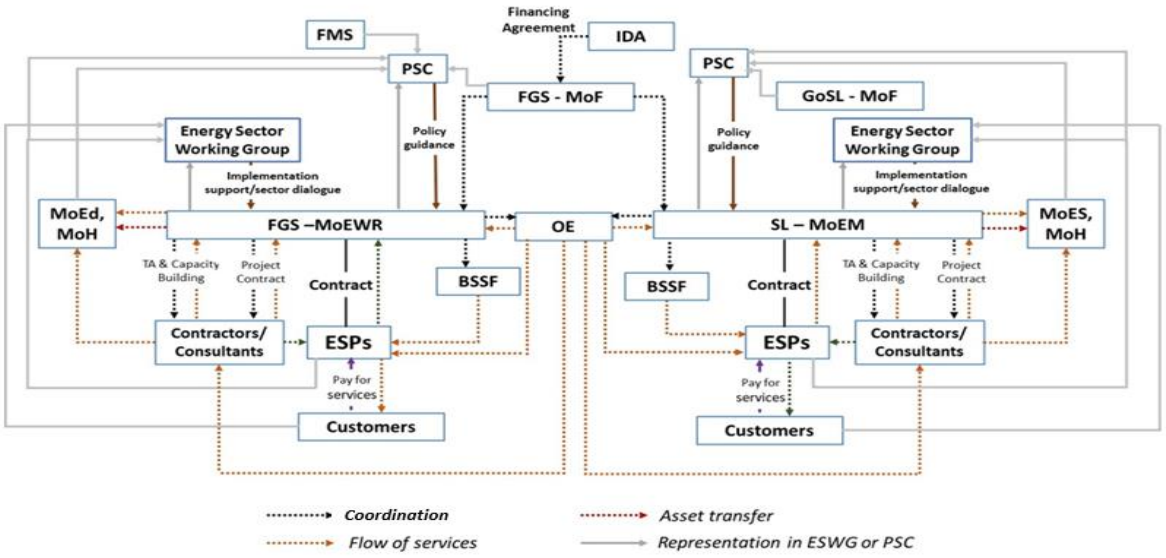
8. **The SOP will establish a win-win-win relationship among public institutions, private service providers, and customers**. Provision of basic services like electricity could play a key role in shoring up the legitimacy of the government as it seeks to reestablish its authority over much of the country, and thus the need to ensure effective development planning for areas that have seen themselves as marginalized for years or recently leaving conflict. The project will reestablish the mandate of public institutions in the power sector and the provision of public financing to ensure equitable and more reliable and affordable access to electricity services for the Somali population. The expanded role of the ESPs will help buttress and encourage an increased involvement of the private sector in the long run in both distribution and generations subsectors. In addition, improving electricity access and affordability will help the country address poverty through increasing household incomes, because increasing access to affordable electricity can create opportunities for the creation of new businesses and associated job creation. Increased and improved electricity services provide an opportunity to the FGS to help the Somali populace see benefits to the reestablishment of state authority with improved service and economic dividends.

ANNEX 2: Implementation Arrangements and Support Plan

Project Institutional and Implementation Arrangements

1. The project will be implemented by, (a) Ministry of Energy and Water Resources, Federal Government of Somalia (MoEWR) in Mogadishu in close coordination with the Federal Member States (FMSs), electricity service providers (ESPs), and the Ministries of Health and Education, and (b) Ministry of Energy and Minerals (MoEM)[35], Somaliland in Hargeisa in close coordination with the Somaliland ministries of education and health education and ESPs. Project institutional and implementation arrangements take into account the following: (a) the IDA Grant Recipient (FGS) and the Recipient Institutions (ministries of energy, education, and health) and (b) the ESPs who currently own, manage, and operate most of the electricity infrastructure. The ultimate beneficiaries, that is, agencies responsible for the operations and maintenance (O&M) of the project assets, are the ESPs that will be responsible for the assets financed and constructed under components 1 and 2 and the ministries of education and health for the solar home systems (SHSs) installed with financing under component 3. Figure 2.1 provides an overview of the project institutional and implementation arrangements.

Figure 2.1 Project Institutional and Implementation Arrangements



Note: MoEd = Ministry of Education; MoES = Ministry of Education and Science; MoH = Ministry of Health; MoF = Ministry of Finance; OE = Owner's Engineer; ESP = Electricity Service Provider; TA = technical assistance; PSC = Project Steering Committee; ESWG = Energy Sector Working Group; FMS = Federal Member States; BSSF = Business Support Services Firm; IDA = International Development Association.

2. The project will rely on the existing institutional and implementation arrangements established under the ongoing Somalia Electricity Access Project (SEAP). The staff at the Project Implementation Units (PIUs) shall be

[35] This is contingent on the FGS-GoSL agreement

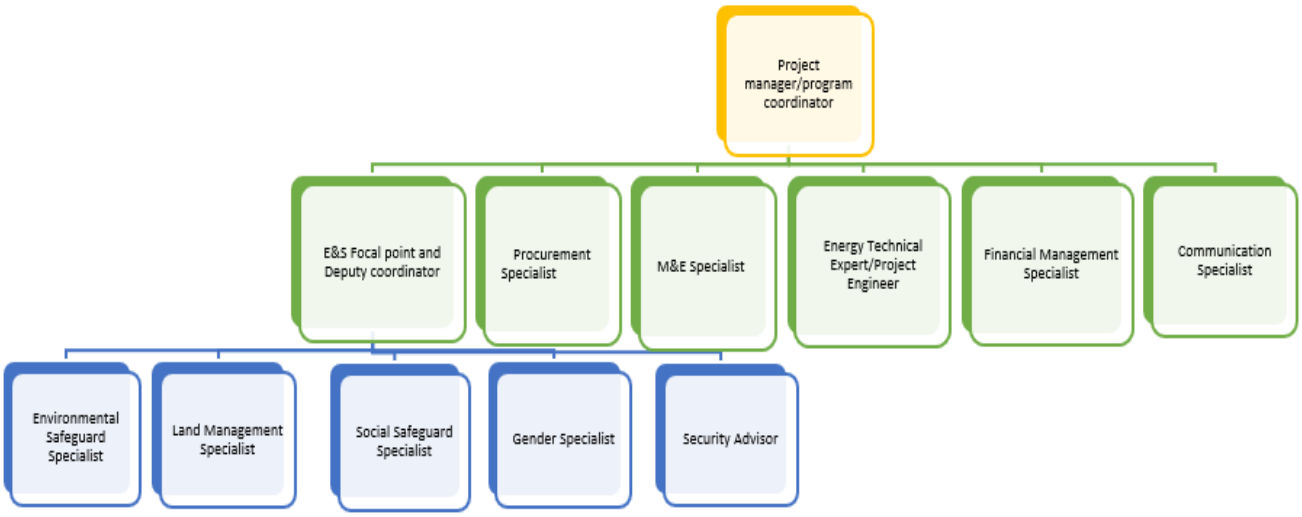
responsible for all the project implementations activities including procurement, safeguards, financial management, monitoring and evaluation (M&E), and project management functions as well as coordination and reporting to the World Bank. The director generals (DGs) responsible for energy at the MoEWR/MoEM shall have the overall oversight of the respective PIU.

3. **Roles and Responsibility of the Director General.** The Director General shall have the overall responsibility of ensuring that the project responds to the Project Development Objectives and is implemented in accordance with the agreed and applicable laws and procedures. Specifically, the DG shall:

- Provide the overall guidance in the selection of the various interventions and/or component activities in coordination with the FMS, the Ministries of Education and Health and ESPs.
- Provide overall implementation guidance and formally review progress and approve the annual work plans.
- Ensure that the PIU is adequately staffed, inclusive of technical and fiduciary expertise, to ensure smooth implementation of the project.
- Provide necessary oversight and approvals as maybe required.
- Seek approvals from the Project Steering Committee as maybe required.

4. **Project Implementation Units (PIUs).** The two PIUs will comprise experts with different skills who will be responsible for the implementation of the project, including but not limited to the following general functions: contracts management, procurement, financial management, stores management, safeguards, and reporting. Each PIU shall have, as core staff, the following: (a) project manager/program coordinator, (b) financial management specialist, (c) procurement specialist, (d) project engineer, (e) environmental safeguards specialist, (f) social safeguards specialist, (g) gender specialist, (h) monitoring and evaluation specialist; (i) Land Management Specialist; and (j) Security Advisor. The PIU shall include members from the ESPs and the ministries of education and health as may be required at the various stages of the project. The PIU staff shall have the responsibility to oversee the project implementation, perform the required technical functions, and serve as the focal points for communication with World Bank, contractors, and consultants. For the respective components, each PIU will be also responsible for preparing the request for bids (RFBs)/request for proposals (RFPs) for tendering, bid evaluation, contract award, contract management, and so forth, and technical assistance consulting firms (for example, owner's engineer [OE]) and the business services support firm (BSSF), financed under the International Development Association (IDA) grant, providing contractors and consultants with support and guidance during project implementation, as well as supervising contractors' and suppliers' compliance with all their contractual obligations as well as with environment and social safeguards requirements. The PIUs' organogram is presented in figure 2.2.

Figure 2.2 Project Implementation Unit Organogram



5. **Owner's Engineer**. An OE, acting as the employer's project manager, shall provide project implementation support to the PIUs in the design, procurement, and contract management to ensure smooth and efficient implementation of the project, including project-related environmental and social safeguards and project monitoring and evaluation. In addition to ensuring that procurements of the project-related goods, works, and services are undertaken in accordance with the grant's agreed procedures and regulations, the OE shall support the PIUs with regard to inspection and supervision of the construction works and site supervision during the installation of equipment and testing, to ensure that the goods, works, and services are implemented in accordance with the designs, specifications, and terms and conditions of the relevant contracts.

6. **Roles and Responsibilities of the OE**. The OEs shall be procured by the two PIUs. Once appointed, each OE shall be the designated project manager to the PIUs. The main role of the OE will be to manage and coordinate the project implementation. A key objective of the OE's role is to ensure that all elements of the project implementation, including the supply and construction contracts, consultancy services, ESMP and RAP (where applicable), are of high-quality standards and are well coordinated, thus minimizing the delays in completion, and commissioning due to programming constraints or incompatibilities between individual components. Reporting requirements and services to be provided shall be detailed in the OE's terms of reference (ToR) and the Project Operations Manual.

7. **Business Support Services Firm (BSSF).** A BSSF, with experience in utility operations, will be hired to support selected ESPs in strengthening their technical and institutional capacity in key functions of the electricity utility business, including but not limited to corporate planning, commercial and network management, and operations. The experts provided by the BSSF will work as advisors twinned with the ESP counterparts for a period of two to three years. The experts will, inter alia, (a) assist the ESP staff to maintain and over time improve the current level of service; (b) coach, mentor, and enhance the capacity of their ESP counterparts in the areas of their technical expertise; (c) assist ESPs to develop and document organizational guidelines and procedures (Operations Manuals); (d) assist ESPs to collect and keep records of performance data; and (e) together with

their ESP counterparts, participate in the preparation and implementation of corporate strategic plans and annual business plans. Reporting requirements and services to be provided shall be detailed in the BSSF ToR.

8. During the implementation phase, the following key oversight structures are envisaged to ensure effective coordination among the implementing agencies, Federal Member States, ESPs and Consumers.

a) ***The Project Steering Committee (PSC):*** At the top level is PSC, to be constituted at FGS and Somaliland Ministry of Energy levels respectively The PSC will provide overall oversight of the project implementation; policy guidance; as well as take decisions on critical high level implementation issues, such as approval of selection criteria and obligations of the beneficiary ESPs. The committee will keep its membership to a limited number to ensure focus on the project (this is indicative at this stage and could change over the life of the project if necessary). It will be co-chaired by the Ministry of Energy with high level representation of the Ministry of Finance, and membership drawn from Ministry of Planning, Prime Minister's office, Ministry of Health, Ministries of Education and Representatives from the private sector. Specific Terms of Reference (ToRs) that clearly specifies roles and responsibilities of the committee, frequency of meetings and expected outcomes will be included in the Project Operations Manual.

b) ***Energy Sector Working Group (ESWG).*** A SWG will be constituted at MoEWR and MoEM level. In addition to providing guidance to project implementation, the ESWG is aimed at fostering the reestablishment of the sector. It will provide a forum for sector dialogue, ownership, and accountability among government, the development partners, and other sector stakeholders to support coordination and harmonization of processes, procedures, implementation, and monitoring of government programs, development partner support, and private sector initiatives. The ESWG will be chaired by the director of energy with cochairs from the private sector and development partners active in the energy sector. The ESWG will be supported by a full-time secretariat. The ESWG, with detailed ToR, will be established prior to project effectiveness.

9. **Governance**. The Project implementation shall be carried out in accordance with the provisions of the "World Bank Anti-Corruption Guidelines", dated July 1, 2016 and revised November 1, 2017. To ensure that measures are in place to deter fraud or corruption, the following mitigation measures will be embedded in the project implementation arrangements:

- Specific aspects on corruption auditing would be included in the external audit ToR.
- Adherence to the Agreed Project Procurement and Financial Management Arrangements.
- The PIU will design a payment checklist in such a way that at all levels and steps necessary to ensure compliance are undertaken and signed by each person involved in the process to hold individuals accountable and that payments are made within the stipulated timelines from the date of submission of the requests for payment.
- Ensure that the processes are not flouted, especially procurement procedures, and ensure that specifications are not restrictive and provide fair treatment of bidders, timely completion of the evaluation, and timely contract award and signature.
- Strong financial management (FM) arrangements will be in place (including a qualified FM specialist and periodic Interim Financial Reports [IFRs], to include budget execution and

monitoring).
- Measures to improve social accountability and transparency are built into the project design

10. **Specific governance areas of concern and mitigating measures are as follows**:

a. *Unwarranted technical specifications in Bidding Documents intended to discriminate against some potential contractors*. The OE will carry out due diligence on the specifications during the request for bids. The OE is to ensure that technical specifications are fair and warranted. The Project's progress reports will include key issues presented in the reports of the OE, which will be shared with the World Bank and availed to the Project Auditors.

b. *Fraudulent Claims of Work and Goods*. To limit the risk of overbilling through reduced or substandard delivery of goods and works, the project shall ensure that the OE has adequate field presence for on-site supervision. The OE will be instructed to be in the field periodically and to include random inspections without prior notice given. Since the physical, geographical and security characteristics of the construction sites may be a major constraint in monitoring the quality and type of work performed by contractors, the Contractors will be requested to provide visual documentation (video or pictures) indicating the work performed at critical stages such as foundation and equipment installation, etc. The OE shall prepare regular reports and care will be taken to verify that the OE undertakes adequate inspection.

c. *Annual audits of the project's financial accounts*. An auditor acceptable to the World Bank and cleared by the Financial Management Unit of the World Bank will conduct the project audits. The audits will follow International Standards on Auditing (ISA) and the audit report together with the management letter will be submitted to the World Bank within six months after the end of the fiscal year. The audit report will be disclosed in accordance with the World Bank's disclosure policy. The PIUs will submit audited accounts for the project with sufficient disclosures of the project's sources and uses of funds in the notes to the audited entity accounts. The project shall be audited annually at the end of each financial year. The ToR for the audit, prepared by each of the entities, have been agreed with the World Bank.

d. *World Bank's procurement guidelines*. The World Bank will review and approve all key stages of the procurement process and will be alert to red flags of collusion and bid steering and other behavior leading to mis-procurement. The World Bank will closely monitor the action plans of the implementing entities in response to FM issues raised in the auditor's Management Letters.

e. *Regular supervision*. The World Bank's project supervision team will conduct frequent dialogue with government and the PIU counterpart teams. The World Bank will conduct at least two formal missions per year with a full complement of experts, including the bank's FM and procurement staff.

11. **Specific Component Implementations Arrangements.**

Component 1. This component will be implemented by the MoEWR/MoEM in close coordination with the ESPs in Mogadishu and Hargeisa. Key component activities will include detailed design of the of

the various activities and procurement of goods and works. The PIU and the ESP will be supported by the OE in the review of the designs, preparation of the detailed specifications, and preparation of the request for bids, contractor selection, and management of the respective contracts. The main contracts include (a) design, supply, and installation of substations and commission (EPC) of the 132KV subtransmission network lines; (b) substation EPC (132KV/33/11KV); (c) supply and Install of 33/11/LV distribution lines; (d) supply of distribution equipment (such as poles, conductors, line accessories, distribution transformers, metering equipment, EPCs for generator synchronization); and (e) line survey services. To build in-country capacity, the EPC contractors shall be encouraged to have local subcontractors, in addition to including the MoEWR/MoEM and the ESP personnel as counterpart staff during the various stages of the contracts' implementation. After the construction is completed, the arrangements would be the following for ownership and operations.

a. *ESP Owned Distribution Network*. For the assets owned by the ESPs, the MoEWR and MoEM will amend the ESP licenses to highlight that the ESPs will continue to own their existing network infrastructure to be rehabilitated and upgraded with government funds, but they will not receive any remuneration until the end of the respective lifetimes. In addition and subject to detailed technical assessments to establish the baseline and targets, the ESPs will be required to report on certain key performance targets, to reflect the benefits of the investments, which will include, (1) technical loss reductions; (2) increased energy billed and commercial loss reductions; and (3) energy supplied to public institutions, (4) ESHS performance including reporting on respective activities on environmental, OHS and social performance and status of implementation of the environmental and social mitigation measures within the reporting period.

b. *Government owned distribution network assets operated by ESPs*. The existing contractual arrangements (the license or service agreement) shall be amended to reflect the government investments. In addition and similar to the above paragraph, the contractual arrangements will include key performance targets to reflect the benefits of the investments which will include, (1) technical loss reduction; (2) increased energy billed and commercial loss reductions; and (3) energy supplied to public institutions, (4) ESHS performance including reporting on respective activities on environmental, OHS and social performance and status of implementation of the environmental and social mitigation measures within the reporting period. The proposed operational arrangements under (a) and (b) mirror similar industry practice of using public resources to undertake infrastructure investments that are later managed and operated by the private sector.

c. *Sub-transmission network*. The proposed 132KV subtransmission network will be new infrastructure. The 132kV sub-transmission network will create bulk supply points to interconnect with existing the distribution grids. The network will be owned and operated by the government. Depending on the results of the institutional options analysis, the government could outsource the initial O&M services or create a new transmission utility company that would operate the new transmission assets.

Component 2. This component will support activities aimed at the hybridization and optimization of

existing minigrids. The component activities will include installation of Battery Energy Storage Systems (BESS) and solar photovoltaic (PV) systems at existing HSDG stations in selected load centers. This component aims at increasing the efficiency of the existing hybrid mini grids (diesel and solar) by optimizing the existing generation capacity and where possible reduce the diesel consumption by augmenting the installed capacity with BESS and additional solar PV generation. The project support will create new assets out of the investments in solar PV systems and Battery Storage Systems to be interconnected to the existing ESPs' privately owned HSDG systems. The new assets will be constructed on sites either owned or leased to the ESPs. The government and ESPs will enter into a contractual arrangement that establishes either a Public Private Partnership, Concession Agreement, or a Service Agreement. The contractual arrangements among others shall highlight that (a) the Government retains ownership of the assets, (b) the ESPs will have the oversight responsibility regarding the O&M and ensuring that the facilities meet the performance standards over their economic lifetime, and (c) ESPs reduce their tariffs.

The proposed implementation arrangements for Components 1 and 2 are based on similar arrangements adopted in power sector projects for countries with comparable institutional and regulatory structures. A similar case is the "Côte d'Ivoire - Electricity Transmission and Access Project (P157055)". This project constitutes a US$325 million investment including reinforcement of transmission systems (225 and 90 kV substations, rehabilitation, reinforcement, and extension of distribution systems (33 kV and MV substations and lines) in 11 major cities and rural electrification of 209 localities in Cote d'Ivoire. The institutional structure of the power sector in Cote d'Ivoire has similar characteristics to Somalia. The *Société des Energies de Côte d'Ivoire* (CI-ENERGIES) is a state-owned asset holding company responsible for managing public assets in the electricity sector as well as planning and contracting of investments. The *Compagnie Ivoirienne d'Electricité* (CIE) is a private company that operates and maintains on behalf of CI-ENERGIES the publicly owned assets (hydropower plants and national transmission and distribution networks) under an "affermage"/lease contract that has been effective for more than 25 years. CI-ENERGIES is the implementing agency for the "Côte d'Ivoire - Electricity Transmission and Access Project". The CIE is closely involved in project implementation in its role as operator of the public infrastructure built under the project. The CIE is supporting CI-ENERGIES by providing inputs for planning and preparation of technical specifications, participating in supervision of the implementation, carrying out acceptance tests, and commissioning of the infrastructure. An agreement has been established between CI-ENERGIES, and the CIE to define their respective roles and responsibilities during project implementation, which complements the provisions of the "affermage"/lease contract. CIE appointed a focal point for the project and engineers dedicated to providing inputs to CI-ENERGIES on project implementation, working directly with the PIU and the owner's engineers.

There are clear similarities between Cote d'Ivoire and Somalia in terms of procurement and construction of publicly funded infrastructure that will be commissioned, operated and maintained by private companies (CIE in Cote d'Ivoire, ESPs in Somalia), even though the institutional framework in the power sector of Cote d'Ivoire is much more mature than in Somalia. The contract between CI-ENERGIES and CIE clearly defines roles, responsibilities, rights and obligations of involved parties in power sector assets management and operation. Therefore, it will be crucial to amend the existing license contracts of ESPs participating in the project, while at the same time a multi-stage roadmap is

prepared and implemented with the purpose of designing, putting in place and strictly enforcing a robust regulatory framework. This phased approach, starting in all cases from the signature and effectiveness of ringfenced concession/license contracts, was adopted by countries in Latin America and other regions that incorporated private sector participation during power sector reform. Concession contracts contained specific provisions for an initial period (4-5 years) during which the sector regulatory framework was fully developed and implemented, through the creation and strengthening of national regulatory agencies. Besides, public financing of assets to expand electrification (network densification and extension) that are subsequently operated and maintained by private concessionaires/licensees is by far the predominant method of network extension and densification in those countries.

Component 3. This component will be implemented by MoEWR/MoEM in close coordination with the Ministries of Education and Health. The systems will be bulk procured to maximize cost savings. The Bill of Quantities will be aggregated at the regional level by the size of the system. The scope of the contract, with several lots, shall include Design Supply and Install and an Operations and Maintenance Contract for five years. The contract shall also include hands-on training on operations, maintenance, servicing and basic repair/ troubleshooting to the selected staff from both the MoEWR/MoEM, Ministry of Education, and Ministry of Health. Specifically, each beneficiary institution/facility, shall designate unit/personnel that will be responsible for monitoring performance of the systems during the O&M period and undertaking operations and basic maintenance services post the O&M contract period. In addition, to support the development of in-house capacity to integrate energy planning for the respective institutions, the Ministries of Education and Health, as part of the project will designate an Energy Officer who will be part of the Project Coordination arrangements with the PIUs. To ensure ownership and sustainability of operations, the systems will be transferred to the respective ministries after the issuance of the Operational Acceptance Certificate; they will ensure the adequate functioning of the systems during the O&M contract period and thereafter will provide adequate budgets for required O&M services including provision of battery and spare parts replacements.[36] Alternatively, the respective Ministries of Health and Education may also decide to enter into a service contract for service provision subject to the country's national procurement guidelines. Specifically, the project will include training of the staff of the Ministries of Health and Education in aspects not only related to the installation and operations of the systems, but also to integrated energy planning. This is aimed at ensuring that in-house capacity is built into the respective ministries to include energy services when the various infrastructure facilities are being planned. Further, to increase the availability of qualified technicians, the project will also include training of staff of the local companies that could be called upon to offer after-sales services.

Component 4 will provide technical assistance and capacity building activities to sector institutions. It will be implemented by the MoEWR/MOEM and benefit all sector institutions, including ESPs as well as the Ministries of Health and Education and other relevant stakeholders.

[36] Preliminary cost estimates for the management of the SHS over the first five years stand at US$9.6 million (calculated as a fixed fraction (2 percent) of the unit installation cost as per the industry standard and including battery replacement).

Financial Management Implementation arrangements

12. **Financial Management** - Financial management capacity challenges that are likely to affect the project exist. These include lack of key FM competencies and internal controls, reliance on consultants, and lack of regulatory framework for key public FM aspects, among others. Various mitigating measures are designed specific to the project and as part of other World Bank and/or donor engagements in the country. Given the consideration for use of country systems (UCS), the project will adopt the UCS in various aspects of the project's FM, including accounting and reporting, banking, oversight arrangements with the Office of the Auditor General, and staffing. This will be supported TA with clear requirement for knowledge transfer incorporated in the ToR. The External Assistance Fiduciary Section (EAFS), already established under the Office of the Accountant General and staffed with mainstream civil servants in consultation with the Directorates of Finance in MoEWR and MoEM, will oversee and manage the project FM. The EAFS units have been fully operational at the FGS, Puntland, and Somaliland for the past six years. The accountant generals will second a project accountant from the EAFS to the PIU. The EAFS and the PIU staff will be trained on World Bank FM procedures. Throughout the implementation of the project, the government is expected to ensure the EAFS and PIU are staffed team of professionals with relevant and adequate qualification and experience acceptable to the World Bank. The EAFS will ensure the following:

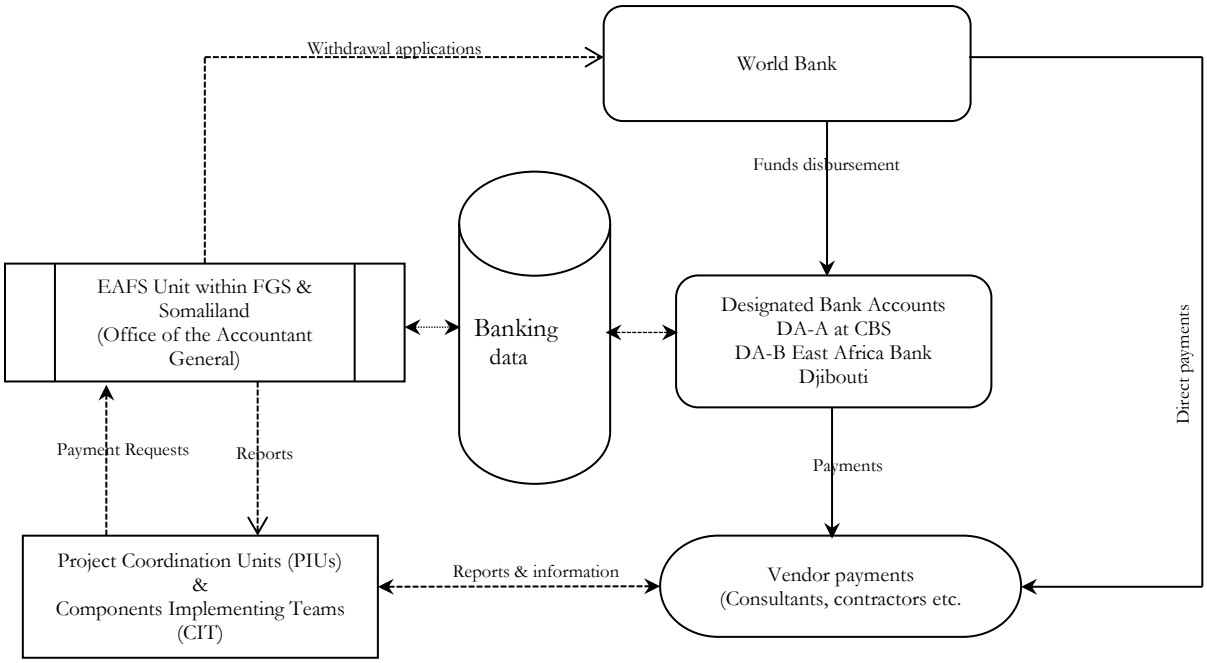
- All important business and financial processes are adhered to.
- Adequate internal controls and procedures are in place.
- Interim un-audited Financial Reports are prepared on a timely basis.
- The financial statements are prepared on a timely basis and in accordance with International Public-Sector Accounting Standards (IPSAS cash-basis).
- The external audit is completed on time and audit findings and recommendations/ issues raised in the management letter are implemented expeditiously.

13. **Budgeting.** The PIU working closely with the EAFS Unit will prepare and submit the project's annual work plans and budget and cash flow forecast for each project component for the necessary approvals by the task team leader (TTL) at the World Bank. The work plans, cash flow projections, and budget will include the figures for the year, analysed by months and quarters. The cash budget for each month and quarter will reflect the detailed specifications for project activities, schedules (including procurement Plan), and expenditure on project activities scheduled respectively for the quarter. All annual cash budgets will be sent to the TTL at least two months before the beginning of the government fiscal year for review and approval. The project's estimated annual disbursements for each component will be integrated and aligned to the MoEWR and MoEM budget calendar (on-budget) and will form part of the appropriated budget by the parliament. Budget utilization reports shall be prepared from the government FM systems (Somalia Financial Management Information [SFMIS] and Somaliland Financial Management Information Systems [SLFMIS]) as part of the internal government periodic reports as well as quarterly reports and submitted to the World Bank. The reports shall provide an overview on all the project resources disbursed to the government through the Designated Account (DA) as advances to finance the eligible project activities as well as disbursements through direct payments. The project budget estimated will be analysed and posted into the FMIS in line with the approved Standard Chart of Accounts (SCoA).

14. **Funds Flow and Banking arrangements.** The projected annual disbursements shall be integrated into the respective budgets of the FGS and Somaliland. Each implementing agency will prepare the budget, work plan, and cash flow forecast and submit for the necessary approvals from the governments and the World Bank. The US-dollar-denominated DAs will be opened in a financial institution acceptable to the World Bank. Payments from the DA will be eligible only for expenditures justified and properly documented. The EAFS will prepare and submit withdrawal applications for the DA. Funds will be transferred into the DAs against an approved withdrawal application as provided in the funds flow diagram in annex 2. The first IDA fund release will be an advance payment based on an agreed ceiling and on the submission of a withdrawal application. Replenishment and reimbursement of withdrawal applications will be accompanied by statements of expenditures, and direct payment will be accompanied by copies of records in accordance with the procedures established in the disbursement letter and the World Bank's Disbursement Guidelines.

15. **DA Signatories.** At the FGS level, the DA-A will be domiciled at Central Bank of Somalia (CBS). The signatories will be (a) Panel A: Director General of MoF (with Director of Administration as alternate); and (b) Panel B: Accountant General (with Deputy Accountant General as alternate). In Somaliland, the DA-B will be hosted at East Africa Bank in Djibouti. The signatories will be (1) Panel A: Director General of MoF (with Director of Finance as alternate); (2) Panel B: Accountant General (with Deputy Accountant General as alternate).

Figure 2.3 Funds Flow Arrangements



16. **Accounting systems.** The accounting system will ensure that financial reports are designed to provide relevant and timely information to the project management units and various stakeholders monitoring the project's performance. It is expected that all levels of implementation will maintain adequate filing and archival systems of all accounting and relevant supporting documents for review and for audit purposes. The project's original financial records, including all the supporting documentations, shall be maintained at the EAFS units.

The project's financial transactions will be captured, recorded, analysed, summarized, and reported in line with the provisions of IPSAS cash-basis accounting. These will be supported by appropriate records and documentation to track commitments and to safeguard assets. To facilitate preparation of the relevant reports and annual financial statements, the project budgets and expenditures will be recorded, classified, and reported through the FMISs according to the approved SCoA. The project will be required to provide periodic and annual reports covering total project expenditures; total expenditure on each of the project's components and activities; and an analysis of that total expenditure into various categories of goods, works, training, consultants, and other procurement and disbursement categories. Eligibility of expenditures will be based on the actual amount incurred and supported by appropriate documentation. Accounting records will be maintained in US dollars. The EAFS in consultation with the FMS will ensure that invoices and payment requests are consistent with signed contracts before processing and release of payments. It will also monitor and report on the utilization of project funds, including the fiduciary standards and the reliability of the FM systems. A project fixed assets register will be prepared, and regularly updated, and physical verification of assets routinely carried out. The fixed assets register will reflect details of suppliers, description and location of goods, original costs, disposal of assets, assets reference (identification) numbers, serial or registration numbers, dates of purchase, assets additions, condition of assets, and assets' useful life and residual value. Contracts registers will also be maintained with respect to all contracts with consultants, contractors, and suppliers.

17. **Reporting.** SFMIS and SLFMIS will be configured appropriately to facilitate generation of the project IFRs directly from the systems. The EAFS units in consultation with the PIUs will prepare and submit approved Interim Unaudited Financial Statement IFRs not later than 45 days after the end of the quarter. The IFRs shall report on all funds received under the project, including any counterpart or other donors' funds received under the project. The reports shall include a statement showing the period and cumulative inflows by sources and outflows by main expenditure classifications, beginning and ending cash balances, and supporting schedules comparing actual and planned expenditures. All IFRs submitted shall be duly reviewed and approved, with originals maintained at the EAFS and copies at the PIUs. Expenditures shall be classified by component, subcomponent, and by categories. The agreed IFR formats will be designed and integrated into FMISs. The EAFS will prepare Project Financial Statements covering all the activities of the project. Signed consolidated Annual Financial Statements for the project shall be submitted to the auditor general at FGS and Somaliland for audit not later than three months after the end of the financial year. The AFSs will be prepared in accordance with IPSAS cash-basis accounting as shall be agreed between the government and the World Bank. The AFS will include adequate notes and disclosures consistent with the cash basis of financial reporting under the IPSAS.

18. **Internal Controls:** The project internal controls procedures and processes will be outlined in the Project Operations Manual and EAFS Manual. The project will ensure that all important business and financial processes are adhered to and adequate internal controls and procedures are in place. The possibility of circumventing the internal control system with colluding practices such as bribes, abuse of administrative positions, misprocurement, and so forth is a critical issue and may include (a) late submission of supporting documents; (b) poor filing and records; (c) lack of system integration; (d) lack of budget discipline; (e) unauthorized commitment to suppliers, bypassing budget and expenses vetting procedures; (f) unsecured safekeeping and transportation of funds; (g) uncertainty over the banking arrangements supporting the project; (h) potential exposure to money laundering; and (i) insecurity and political instability. These are mitigated as follows: (a) specific aspects on corruption auditing included in the external audit and monitoring arrangements ToR; (b) FM Procedures (as part of EAFS Manual) approved and in operation for the project; (c) strong FM arrangements

(including qualified project accountants in the EAFS units); (d) periodic IFRs, including budget execution and monitoring; (e) measures to improve social accountability and transparency built into the project design by ensuring that project reports are available to the public; and (f) annual PFM forums.

19. **Fixed assets control procedures over fixed assets and contracts management will be the responsibility of the EAFS in consultation with the PIU.** The Internal Audit function, once established in FGS and Somaliland, will be mainstreamed into the project activities. The Project will liaise with the internal audit unit to ensure that project internal audit reviews are included in the annual work plans. The project internal audit reports shall be prepared and shared with the EAFS/PIU and made available to the World Bank team during project supervision. The internal audit capacity is to be strengthened and linked with other governments' and development partners' capacity building interventions. The internal auditors will carry out risk-based system audits to strengthen the project's internal control systems.

20. **External Audit:** The auditors general (FGS and GoSL) will carry out a project external audit with support of technical assistance. An external audit firm will be engaged and funded by the project to carry out the audit of the project activities. The audited project financial statements together with any additional information required will be submitted to the World Bank not later than six months after the end of the project. The audit would be in conformity with the World Bank's audit requirements and in accordance with internationally recognized auditing standards. The auditor will express an opinion on the financial statements in compliance with ISA and prepare a Management Letter giving observations and comments and providing recommendations for improvements in accounting records, systems, controls, and compliance with financial standards. The external audit will pay special attention to the risks of material misstatement of the financial statements due to fraud, in line with ISA 240: "The auditor's responsibilities relating to fraud in an audit of financial statements". The specific project's FM arrangements will further be spelled out in the Project Operations Manual.

Procurement

21. **Procurement Capacity Assessment.** The PIUs have basic familiarity with the World Bank's Procurement Regulations and have experience in implementing the Bank financed SEAP (which is in progress). However, the PIUs have limited familiarity and proficiency in articulating procurement and contracting processes of similar magnitude and scope as for the SESRP which has an increased spending envelope versus SEAP. The procurement assessment considered (a) the present contract management arrangements including storage of procurement materials (Inventory and Material Management), (b) the low score in contract enforcement, (c) the prevailing uncertainties due to COVID-19, (d) the FCS context, (e) the systemic weaknesses in the current procurement practices and delays in decision-making, and (f) the limited market potential. Proposed mitigation measures, among others, include:

- Providing focused and need-based refresher procurement training
- Upgrading the Project Operations Manual
- Deploying the Owner's Engineer to augment capacity,
- Utilizing a Contract Management Plan (prepared as part of the PPSD) for periodic monitoring and progress review
- Institute an efficient material management system without any stockouts
- Timely advice & decision making by the management, and

- Disclosure of procurement information. The operation and maintenance provisions will be included as part of the scope of requirements in the bid and proposal documents and resulting contracts to ensure that the equipment installed under the project meets warranty and contractual obligations.

22. Procurement risks. The project procurement risk is "High" based on the perceived risks. After implementation of the proposed mitigation measures, the residual procurement risk rating for the project is determined as 'Substantial'. The Bank may periodically review the risk rating during the implementation of the project. In addition to procurement risks, there are additional risks related to security, access to sites, and transportation due to poor road networks. To address this security risk and potential bidder's perception, a provisional sum is earmarked for contractors to arrange their security arrangements as part of the scope of requirements in the bid and proposal documents and resulting contracts. This measure may help the potential contractors to consider participation in the procurement opportunities and give assurance to contractors working on field-based contracts. This risk mitigation is in addition to the government's support and security arrangements discussed in paragraph 29 below.

23. **Applicable Procurement Framework. Procurement** will be carried out in accordance with the World Bank's **Procurement Regulations for IPF Borrowers dated November 2020** (**Procurement Regulations)**; the *Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants*, revised July 1, 2016; and the provisions stipulated in the Financing Agreement.

24. **Procurement implementation arrangement.** For implementation of the ongoing SEAP, two functional PIUs were established at MoEWR and MoEM. The same PIUs will be utilized for implementation of SESRP. The implementation timelines of SEAP (stipulated to be closed on June 30, 2022) and SESRP are overlapping. The expertise gained and institutional memory will be beneficial for implementation of SESRP. The PIUs are staffed with a dedicated procurement specialist. In both the PIUs, an adequate number of officials (13 from FGS and 2 from Somaliland including Procurement Specialists) dealing with procurement either directly or indirectly have undergone procurement training with focus on the World Bank's procurement regulations. Considering the increased spending envelope for SERSP and the procurement profile, the staff needs timely advice and support in articulating high-value and complex procurement transactions envisaged through SESRP. The World Bank continues to review the capacity requirements and staff turnover and provides need-based refresher trainings periodically, including training to manage the Systematic Tracking of Exchanges in Procurement (STEP) portal.

25. **Project Procurement Profile.** The project will involve the supply and installation of subtransmission and distribution networks as well as synchronization and automation of the numerous generators and transmission and distribution, lines including building sub-stations, SPV-HSDG hybrid generation units with BESS, and standalone SPV systems augmented by BESS. The procurement profile also includes various technical assistance activities to enhance the ESI institutional capacity through developing policy, regulations, planning, O&M standards, safety, and technical performance. The procurement profile is a mix of high value and high risk as well as decentralised low value procurement activities. The project will involve the Supply and Installation (S&I) of the subtransmission and distribution network (greenfield as well as brownfield), synchronization and automation of numerous generators under component 1**,** the hybridization of High-Speed Diesel Generators (HSDG) with solar PV and Battery Energy Storage Systems (BESS) in component 2, and standalone solar PV systems for Education and Health facilities in component 3. The procurement profile also includes the selection of an Owner's Engineer (OE), a design and supervision consultant, advisory and strategic studies (developing

policy, regulations, planning, management and operations standards, safety and technical performance) to enhance the institutional capacity of implementing ministries and the ESI in Somalia.

26. **Project Procurement Strategy for Development (PPSD) and Procurement Plan (PP).** The borrower has prepared the PPSD and Procurement Plan for the first 18 months with a focus on key procurement activities to select the optimum fit-for-purpose method and market approach and has prepared the PP for at least the first 18 months. In terms of spending profile, the project envisages to procure US$60.5 million or about 40 percent of the project envelope (including a few individual consultancies) in the first 18 months. The PPSD includes a summary on procurement risk, mitigation measures, an action plan, and a procurement implementation support and supervision plan (the Contract Management Plan is as an annex to PPSD). The PPSD discusses the merits and demerits of feasible selection methods and market options for identified key procurement transactions and selects the best Fit for Purpose selection method and market option to derive Value for Money (VfM) for these key procurement transactions. For component 1, the Supply & Installation (Plant Design S&I) method will be the Fit for Purpose selection method for S&I of MV lines. The Owner's engineer will be procured through hybrid QCBS (lump sum for tasks related to deliverables and time-based for supervision). The PPSD proposes RFP (after Initial Selection) as selection method and the Open International option using rated criteria as market option for the design, engineering, supply, construction, erection, testing and commissioning (including the operation and maintenance period) for component 2. The life cycle costing will be considered after the conceptual design. The PPSD proposes to package component 3 into decentralized small value procurements to gain economies of scale and elicit the participation from competent potential providers in this market segment.

27. **Procurement Process.** A manual procurement process will be followed (no e-government procurement). World Bank–prescribed Standard Procurement Documents with ESMF built-in features will be used for procurement transactions. PIUs have evaluation guidance templates for preparation of evaluation reports.

28. **Contract management.** The PIUs will be responsible for overall implementation and management of awarded contracts in accordance with the agreed contractual obligations. The contract management/administration/monitoring/supervision is perceived as a function of the user sections/technical departments, and often the procurement team is not updated with the progress, neither physical nor financial, and changes and variations (amendments). The procurement specialist or engineers at the PIUs will be entrusted with the contract management function jointly with the concerned user and technical departments. Throughout the project an Owner’s Engineer and a third-party monitoring agency will be hired for all complex and high-value contracts. Also, for these contracts, a Contract Management Plan (CMP) was prepared and annexed with the PPSD. These measures augment the capacity of the PIUs in managing and implementing the awarded contracts as per the agreed contractual obligations.

29. **Security and safety measures.** The respective governments will prepare and adopt security management plan of the project prior to issuance of bids for contractors and maintained throughout the project. A dedicated security advisor will be selected at each PIU to manage security and oversee the security arrangements. The FGS and GoSL will provide all necessary clearances and institute security measures to allow contractors to work with adequate protection. Besides, a provisional sum will be earmarked for security and included as part of the procurement document. This amount may be utilized by the contractor for making its security arrangements. Mitigation measures for security include (a) allocate a necessary provisional sum for security costs, (b) ensure

permanent security presence at the work sites (joint responsibility of states and national authorities) and strengthen security measures, and (c) allow permissible subcontracting to national contractors who may better manage local matters.

30. **Procurement monitoring**. The PIUs will develop customized monitoring to review decentralized and scattered works by using a web-based platform and mobile phone networks. The procurement monitoring is part of the responsibilities of the third-party monitoring agency (a dedicated consulting firm to be hired by each PIU).

31. **Systematic tracking of exchanges in Procurement (STEP).** The project will use STEP, a planning and tracking system, which will provide data on procurement activities, establish benchmarks, monitor delays, and measure procurement performance. The initial PP for at least the first 18-months has been prepared by the PIU and cleared by the World Bank. The PP will also be cleared through STEP. The PP shall be updated at least annually. All procurement to be carried out under the project shall be included in the PP and cleared by the World Bank prior to procurements.

32. **Procurement Implementation Manual (PIM).** A Procurement Implementation Manual was developed for SEAP. The PIM will be updated with detailed project implementation arrangements and responsibilities duly considering the increased spending envelope and institutional arrangements with the involvement of ESPs, and the ministries of Health and Education.

33. **Hands-on Expanded Implementation Support**. Two PIUs (one in FGS and one in Somaliland) were already established through the ongoing World Bank financed SEAP. These PIUs are staffed with dedicated procurement specialists. They have a fair understanding of the World Bank's Procurement Regulations (New Procurement Framework) and already use the STEP portal. Procurement training has been given to an adequate number of engineers and officials (13 from FGS and 2 from Somaliland including procurement specialists) dealing with procurement with a focus on World Bank procurement procedures and regulations. The World Bank intends to build additional capacity and provide the desired additional support for key high risk and high value procurements. The World Bank is already supporting PIUs for high risk, high value procurement activities at key stages of the procurement cycle. This support includes sharing of similar procurement activities (knowledge base) for preparation of bid and proposal documents, provide inputs and review of draft procurement documents (RFP/RFB/RFQ), evaluation reports, and draft contracts before uploading to STEP. The World Bank extends this additional support besides prior reviewing of all contracts (mandatory requirement for Somalia). The World Bank's support is already akin to Hands-on Expanded Implementation Support (HEIS). The World Bank is in the process of establishing universal HEIS arrangements for all projects financed in Somalia.

34. **Disclosure of procurement information.** Contract award details will be published in the official website. The following will disclosed: (a) a Procurement Plan and updates, (b) an invitation for bids for goods and works for all contracts, (c) request for expression of interest for selection or hiring of consulting services, (d) contract awards of procurements through open requestions for proposals or bids with international and national target markets, (e) consolidated list of contracts and purchase orders placed under limited request-for-quote procedures or direct contracting on a quarterly basis, (f) a monthly financial and physical progress report of all contracts, and (g) a report of actions taken on complaints received on a quarterly basis.

35. **Complaints Handling.** For the procurement-related complaints, the project will follow the procedure prescribed in the Procurement Regulations. To deal with the complaints from bidders, contractors, suppliers, consultants, and the general public, a complaint-handling mechanism will be established. A formal grievance redress mechanism or procurement complaint handling system was established under SEAP and will be used for SESRP. Procurement records and documents were maintained in accordance with the guidance for procurement record keeping. The complaint handling mechanism and record keeping will be further strengthened under the project and will be included in the Project Operations Manual.

36. **Record keeping.** All records pertaining to the award of tenders, including bid notification; registers pertaining to the sale and receipt of bids, bid-opening minutes, and bid-evaluation reports; all correspondence pertaining to bid evaluation, including communication sent to or with the World Bank in the process; bid securities; and approval of invitation to and evaluation of bids will be retained by respective agencies and uploaded in STEP.

37. **Fiduciary oversight and Procurement Review by the World Bank.** The World Bank shall prior review all contracts set in the Procurement Plan regardless of the nature and value following the prior review thresholds guidance which currently requires that all contracts are prior reviewed.

Strategy and Approach for Project Implementation Support Plan – role of the World Bank

38. The strategy for implementation support (IS) is based on the nature of the project and its risk profile. It aims to make implementation support to the client flexible and effective and will focus on implementation of the risk mitigation measures identified.

39. **Risks related to the sector reestablishment and capacity enhancement.** The project will support addressing these key risks through the technical assistance provided under component 4, policy dialogue, especially through the proposed Somalia Inclusive Growth Development Policy Operation Series (P174889). The World Bank's project team will maintain a close dialogue with the FGS, GoSL, and ESPs to ensure that proper focus on sector institutional reestablishment and project implementation is maintained.

40. In coordination with the MoEWR, MoEM, and the ESPs, the World Bank's project team will closely monitor project activities and the technical assistance activities to, (a) coach and mentor the staff in the aspects of policy, planning, regulation, utility operations, and management; (b) set up systems to follow up on the progress; and (c) prepare and implement various undertakings (such as the Sector Least-Cost Development and Investment Plan, secondary regulations required for both economic and technical regulations, and ESP business processes and operational Manuals).

41. As part of the implementation process, the project will share with policy and decision-makers success stories telling how having and using the various guidelines, systems, and process has led to gains in and promoted a culture of accountability (for example having a Sector Prioritised Investment Plan helps to take priority projects to the market through an open, transparent, and competitive process and reduces). The World Bank team will continuously encourage the top management of the key agencies to actively involve staff at all levels in the project implementation so as to promote a culture of awareness of interdependencies and accountabilities between functions, to help to breakdown organization silos, and to create an aligned ESI.

42. **Project Management.** The World Bank task team will monitor the capacities of the PIUs throughout project implementation to ensure that they are adequate to implementing the project. In addition, the OE, designated as the project manager, shall support to strengthen the PIUs project management capacity. The World Bank will provide additional training where needed in relation to the World Bank fiduciary and reporting requirements, as well as in the areas of gender, environmental, and social safeguards management. In addition, the BSSF will support the ESPs to enhance their business processes, both managerial and operational. In addition, a key intervention, will be to support the Ministries of Education and Health to establish in-house capacity to integrate energy planning.

43. **Procurement.** Implementation support will include, (a) reviewing of the Procurement Plan and providing suggestions, (b) reviewing procurement documents and providing timely feedback, and (c) monitoring procurement progress against the agreed Procurement Plan. More intensive support will be provided during the first 12 months to ensure the timely procurement and contracting of the big packages.

44. **Financial Management.** Supervision of project FM will be performed on a risk-based approach. Supervision will review the project's FM system, including but not limited to, accounting, reporting, and internal controls. The World Bank team will assist the PIUs in improving FM and reporting. The FM supervision will be conducted by FM specialists.

45. **Environmental and social impact management.** The World Bank will provide support through the regular review of the semi-annual environmental and social monitoring and evaluation reports and will follow up any issues with the PIUs and their consultants.

46. **Implementation Progress.** The World Bank will closely monitor the overall progress of project implementation by reviewing the semi-annual progress report, the execution of the Procurement Plan, actual disbursement, and so forth. The World Bank will provide support by regularly visiting the project, helping to identify arising issues that impede project progress, and discussing and agreeing on actions to resolve critical issues. Further, geo-tagging of equipment procured under the project will be used as a means improve accountability and transparency.

ANNEX 3: Economic and Financial Analysis

1. **Methodology[37].** The economic returns are assessed in a standard cost-benefit analysis. Component 4 is excluded since the economic benefits of technical assistance (TA) outcomes are difficult to monetize. The numeraire is the US dollar. The typical energy services provider (ESP) will price electricity in US dollar terms, even in the (unlikely) event that they keep books in Somali shillings. Benefits of components 1 and 2 are based on the economic value of displaced diesel fuel. The social benefits of electrification of health and educational facilities cannot easily be monetized in the absence of reliable health data, so as a proxy for willingness-to-pay we again use the avoided cost of diesel generation that would provide the equivalent electricity output. Economic returns are estimated for typical projects under each component, then aggregated to match funding allocations for each component for the calculation of an aggregate project economic return.

Critical assumptions

2. **Three assumptions dominate the analysis: the cost of diesel fuel, the cost of (high-speed) diesels used by all the ESPs, and the cost of imported photovoltaics (PV) and battery energy systems (BESS)**. Somalia has some of the highest diesel prices in Africa, with average prices over the past five years from US$0.64 per liter to US$1.1 per liter (which attract no VAT or fuel levy). Prices (and exchange rates) vary widely across the regions (table 3.1).

Table 3.1 Retail Diesel Prices in Somalia

	diesel price SOS/liter	Exchange rate SOS:USD	diesel price $/liter
January 2021			
Bay, Bakool, Gedo, Hirar	29,333	26,958	1.09
Juba	22,344	22,644	0.99
Shabelle [Mogadishu]	17,667	25,842	0.68
Banadir	13,433	25,175	0.53
Central	17,550	29,563	0.59
Northeast	21,250	38,321	0.55
Northwest [Somaliland]	5,377	8,533	0.63
5 year average (2016-2020)			
Bay, Bakool, Gedo, Hirar	25,630	24,056	1.07
Juba	26,200	23,798	1.10
Shabelle [Mogadishu]	19,391	24,007	0.81
Banadir	15,126	23,600	0.64
Central	20,810	25,070	0.83
North east	21,196	27,319	0.78
Northwest [Somaliland]	6,308	8,650	0.73

Source: FAO Market Update, January 2021

3. **The costs of diesel generation are strongly dependent upon the loading**. At full load, efficiency is around 30 percent; at partial loads below 50 percent the efficiency falls rapidly. One of the main problems in Somalia's

[37] This annex is extracted from a detailed *Background Report on Economic and Financial Analysis*.

ESP operation is that much of the generation is at low loading (in addition to lack of synchronization), compounded by poor quality of diesel fuel, and high distribution losses.

4. Current PV project costs in the Gulf Cooperation Council (GCC) countries, Egypt and Kenya are around US$350 - 400/kWp. With the Somalia CAPEX multiplier of about two and half (x 2.5), the PV CAPEX is assumed to be US$1,000/kW.

5. Battery cell prices ex-factory China/Korea are US$140/kWh. Assessing balance of system costs at US$160/kWh then total cost for delivery in GCC/Egypt/Kenya would be US$300/kWh. Taking into account the Somalia premium (inland freight and insurance, security premium, technical experts for installation), the project PV CAPEX is assumed at US$750/kWh.

The discount rate for the baseline estimate of economic returns follows relevant Bank guidance documents.[38] Its value is based on the expected real per capita GDP growth rate. With population growth rate still at around 3 percent, over the past few years the per capita growth in real GDP has been very close to zero. Under these circumstances, over the next decade it is unlikely for the per capita GDP growth to exceed 2 percent, for which the Bank's assumptions under the Ramsey formula sets the default discount rate at 4 percent.[39]

General assumptions for economic analysis

6. The following assumptions apply to the analysis of all the main project components (assumptions for the individual components follow below) [40]:

- **Discount rate**: 4 percent
- **Numeraire**: constant 2021 US$
- **Project life**: 15 years. With an assumed start date of 2022, projects built in 2026 would record benefits up to 2041.
- **Salvage values**: while PV life is taken at 15 years, it would not be unusual for PV panels to last well beyond 15 years. For the sake of conservative calculation, no end-year salvage credits are taken.
- **Diesel life**: in the counter factual, replaced every 3 years, typical of diesels running under wet stacking conditions and poorly maintained. It is assumed that all diesels are new in 2023, and then replaced every 3 years. For all ESPs optimized by the project, diesels are replaced every 4 years.
- **Diesel O&M costs** are ignored. We have no information on diesel O&M expenses typically incurred by ESPs. One may be certain that under the synchronized and optimized conditions of the proposed interventions, the O&M costs will be lower: ignoring these ensures conservative result.
- **Diesel price to the ESP**: US$0.7/liter (25percent higher in inland areas)

[38] World Bank, *Discounting Costs and benefits in Economic Analysis* of World Bank Projects, OPSPQ, 2016.
[39] This rate compares well with the discount rate in the Kenya Off-grid solar access project (PAD 2008) of 6 percent.
[40] The detailed background report includes some additional project assessments, including (1) the addition of an additional (smaller) diesel sized just for night time operation, and which allows a much better match between the typical load profile and high loadings in diesels, and (2) the PV hybridization of a rural hospital in Somaliland that runs diesels at very low loadings and faces a diesel price of US$1.15/liter.

Sub-component 1.1: Generator synchronization and automation

7. The assessments in the PSMP suggests huge savings from synchronization and optimization.[41] Lacking details on actual past load growth or reliable data on actual consumption, the economic analysis adopts a configuration that replaces a 2 MW HSDG by three equally sized and synchronized diesels.[42] Additional CAPEX required for busbars, cables and connections, are based on recent similar costs for a synchronization project in Pakistan.[43] The ERR is 47 percent; with 300,000 liters of diesel saved each year. When GHG emission reduction benefits are included the ERR increases to 53.3percent at the low social value of carbon, and 59.2 percent at the high value.

Sub-component 1.2: Sub transmission and Distribution network interconnection in the major load centers

8. The ESPs in the target areas operate independently with significant infrastructure and operations duplication. The CAPEX investments will be in distribution system facilities to inter-connect with neighbours, building busbars to permit synchronization, reenforce the distribution network, and construct a sub-transmission network in Mogadishu and Hargeisa. The benefits are modelled as reduction in technical losses in the distribution system (from the present 40 percent to 32 percent, which may well be conservative), synchronisation (as proposed for smaller systems under component 1A), and optimisation of diesel operations to improve efficiency (modelled by extending the assumed diesel lifetime from 3 to 4 years).

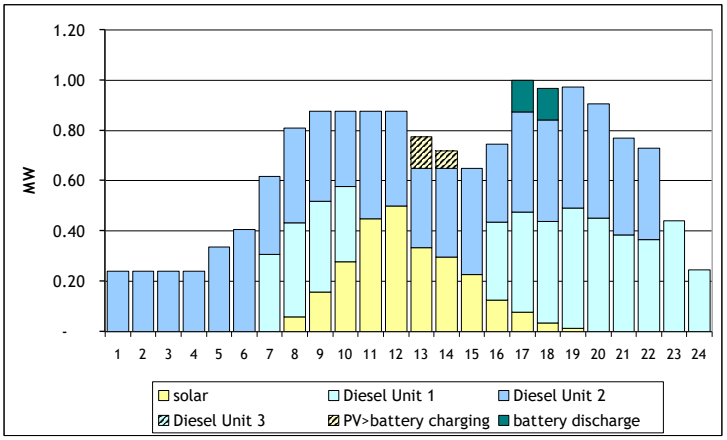
9. The ERR for a representative 2 MW ESP is 43 percent (NPV 34.8 million). The highest uncertainty in the CAPEX estimate is the cost of distribution network extension, connection and rehabilitation, which absent a map (or single line diagram) of the network topology, is hard to gauge. However, the switching value for this CAPEX is US$ 4.87 million – of highly unlikely magnitude for a 2 MW system.

Component 2: Hybridization and Battery storage systems for minigrids

10. In a hybridized system, the number of diesel generators and their size, and the PV field size, are selected in such a way to maximize the generator loading and hence efficiency (and minimize fuel burn). The benefit derives therefore not just from displacing diesel with PV, but also from higher efficiencies in the diesel generator units (Figure 3.1).

[41] Based on survey data of daily generation in ESPs of 885 MWh, in an automated and synchronized system this same installed capacity could supply 2,638 MWh, a multiplier of 2.98 (PMP, Table 103).
[42] The model builds upon the same assumptions as used in the PSMP.
[43] Amin, U. et al., 2014. Implementation of Parallel Synchronization Method of Generators for Power and cost saving in University of Gujrat. Energy and Power Engineering, Vol 6, No 10. This makes the same assumption of constant demand in a system of 4.7 MVA (similar to a large Somalia ESP) presently served by 7 individual diesels and reports costs savings of 30 percent.

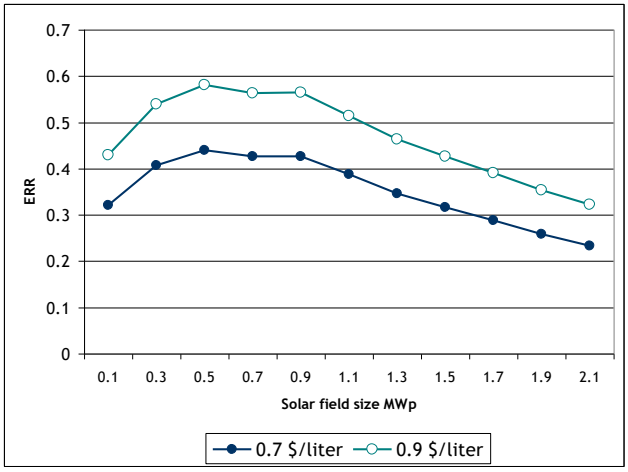
Figure 3.1: Loading Pattern, 500 kWp PV Field with 125kVA/250kVA BESS



Load profile as represented in the PSMP.

11. The optimal size of the solar PV/BESS is a function of several factors such as[44]: (a) the diesel price (for example, at US$0.7/litre diesel price, for a 1 MW HSDG, a 500 kWp field would be optimal (Figure 3.2); (b) the number and size of HSDG units, (c) the size of the solar field, and (d) the actual load profile to take into account any seasonal variation and prospects for load growth.

Figure 3.2: Optimal Size of the Solar PV Field, Beletweyne Hybridization Project



12. Table 3.2 shows the economic returns for a typical PV hybridization project – a small 1 MW system in the town of Beletweyne, 340 km road distant from the nearest Port (Mogadishu), with a population of 225,000. The region reports a diesel price in excess of US$1.00/liter (table 3.1). Other assumptions include:

- Additional CAPEX (US$20,000) for synchronization software and misc. costs associated with off-site PV fields (one implementation model would provide the PV energy by the DSI contractor)

[44] The requirements are set out in the World Bank's Good Practice Note on Economic Analysis of BESS, May 2020.

- Diesel price of $0.875/liter (applying a multiplier of 1.25 to the coastal price)
- Losses: 20percent, average tariff US$0.7/kWh
- Life extension of the remaining diesels, now fully optimized, of 1 year
- BESS 125kW/250kWh, with CAPEX 750$/kWh

Table 3.2: Economic Returns of a Typical Hybridization Project

				2023	2024	2025	2026	2027	2028	2029	2030
				0	1	2	3	4	5	6	7
[1]	**Baseline system**										
[2]	CAPEX	477	[$/kW]								
[3]	installed capacity	1000	[kVA]								
[4]	CAPEX	3	[USm]	*1.84*	0.477	0.000	0.000	0.477	0.000	0.000	0.477	0.000
[5]	annual generation		[GWh]			5.613	5.613	5.613	5.613	5.613	5.613	5.613
[6]	Fuel costs	0.875	[USm]	*20.21*	0.000	1.891	1.891	1.891	1.891	1.891	1.891	1.891
[13]	**total cost**		[US$m]	*22.05*	**0.477**	**1.891**	**1.891**	**2.368**	**1.891**	**1.891**	**2.368**	**1.891**
[14]	**Modified system:PV+BESS**										
[15]	***diesels***										
[16]	capital cost	477	[$/kW]								
[17]	installed capacity	1	[MW]								
[18]	capital cost	0.477	[USm]	*1.47*	0.477	0.00	0.00	0.00	0.48	0.00	0.00	0.00
[19]	Sychronisation		[USm]	*0.02*	0.02							
[20]	additional CAPEX		[USm]	*0.00*	0							
[21]	***Solar***										
[22]	capital cost	1000	[$/kW]								
[23]	PV installed kWp	500	[kW]								
[24]	PV CAPEX	0.5	[USm]	*0.48*	0.5							
[25]	PV OPEX	0.05	[USm]	*0.27*	0	0.03	0.03	0.03	0.03	0.03	0.03	0.03
[26]	BESS capacity	250	[kWh]									
[27]	BESS CAPEX	750	[USm]		0.188							
[28]	BESS OPEX	0.1	[USm]			0.02	0.02	0.02	0.02	0.02	0.02	0.02
[29]	Fuel costs unit 1		[USm]	*6.86*	0	0.64	0.64	0.64	0.64	0.64	0.64	0.64
[30]	Fuel costs unit 2		[USm]	*10.07*	0	0.94	0.94	0.94	0.94	0.94	0.94	0.94
[31]	Fuel costs unit 3		[USm]	*0.00*	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[43]	**total cost**		[USm]	*19.55*	**1.18**	**1.63**	**1.63**	**1.63**	**2.10**	**1.63**	**1.63**	**1.63**
[44]	**Net economic flows**		[USm]	*2.50*	**-0.71**	**0.26**	**0.26**	**0.74**	**-0.21**	**0.26**	**0.74**	**0.26**
[45]	ERR			43%								

Note: Screen snapshot only; calculations are for a 15-year life (also for the other sample tables below).

13. The returns of 43 percent (NPV 2.59 million) are high. For locations with lower diesel costs, the ERR is 34percent.

Component 3: Stand-alone Solar Off-grid Access to Public Institutions

14. Most of these systems will be in rural areas and are assumed to have a diesel cost that is 25 percent higher than the baseline value of US$0.7/litre (diesel self-generation being the proxy for WTP). The CAPEX for the typical 10kW system is US$59,500, with an estimate annual consumption of 35 MWh. The diesel consumed in the counterfactual diesel electrification provides an annual benefit of US$13,000.

15. The ERR for such a typical health centre PV electrification is 18.3 percent (NPV US$71,600). At diesel prices of US$1.0 (the Hospital in Sanaag, Somaliland, that is presently considering PV hybridization, reports a diesel price of US$1.15/litre), the ERR increases to 28 percent.

Aggregate economic returns

16. The aggregate economic returns and its component parts are shown in Table 3.3. The lowest returns are for component 3, but the social benefits of improved health and educational outcomes will surely exceed the WTP proxy used in the analysis. The present operation of the ESPs is inefficient, losses are high, and diesel fuel expensive that even with the application of a two and half multiplier over international/regional price comparators, the proposed interventions have high returns. Switching values are shown in Table 3.3.

Table 3.3: Economic Analysis

				NPV	2023	2024	2025	2026	2027	2028	2029	2030
					0	1	2	3	4	5	6	7
[1]	**CAPEX outlays: Implementation plan**											
[2]	Synchronisation	15			10%	20%	50%	20%				
[3]	System rehabilitation	60			10%	20%	50%	20%				
[4]	PV Hybridisation	20			10%	20%	50%	20%				
[5]	Electrification	40			0%	14%	36%	50%				
[6]	total	135										
[6]	**Economic returns by component**											
[7]	Synchronisation	47%	[$USm]	*51.8*	-1.5	-2.5	-6.0	3.4	7.4	12.0	0.5	5.1
[8]	System rehabilitation	43%	[$USm]	*370.4*	-6.2	-13.7	-33.1	-1.8	22.2	67.4	7.9	42.3
[9]	PV Hybridisation	43%	[$USm]	*63.4*	-2.0	-3.3	-7.8	3.3	8.8	11.5	4.8	7.4
[10]	Electrification	19%	[$USm]	*42.0*	0.0	-5.6	-13.3	-16.0	8.1	8.1	8.1	8.1
[11]	**Project total**		[$USm]	*548.9*	**-9.7**	**-25.1**	**-60.1**	**-11.1**	**46.5**	**99.0**	**21.2**	**63.0**
[12]	ERR		[ ]	39.0%								

These returns are robust to all the main (and many) uncertainties. Returns are so high that reaching the switching values is highly improbable. The results are shown in table 3.4.

Table 3.4: Sensitivity Analysis Switching Values (Impact on Project Aggregate Economic Returns)

	units	Baseline	Switching value	Assessment
Diesel price	$/liter	0.7	0.13	Such a low diesel price has close to zero probability of being reached
PV CAPEX	$/kW	1000	>5000	PV prices are likely to continue to decline, not increase. $5000/kW might have applied 15 years ago
Diesel life extension consequent to synchronization and optimization	year	1	[undefined]	Even when no life extension occurs (in any of the project components), the ERR reduces only to 27%
Diesel CAPEX	$/kW	477	[undefined]	Even at 100$/kW ex-factory in the exporting country, the ERR is still 29%
Technical loss reduction	[ ]	8	[undefined]	Even looking just at the ERR for rehabilitation, at zero loss reduction the ERR is 21.5% (that derive from the synchronization and optimization parts of the project

17. The quantitative risk assessment (Monte Carlo simulation) that looks at all of uncertainties simultaneously (rather than just one variable at a time holding the others constant at their base estimate) provides a more useful indication of risk. For each uncertain input assumption, one stipulates plausible upper and lower bounds of uncertainty as shown in Table 3.5. Assuming uniform distribution within these bounds maximizes the relative weight given to the extreme values, and hence increases the variance of the ERR estimate.

Table 3.5: Plausible Bounds of Uncertainty

	units	Lower Bound	Baseline value	Upper Bound
Local diesel price (baseline value 0.7$/liter)	$/liter	0.5	**0.7**	1.2
2030 Global oil price	$/bbl	55	**70**	80
Somalia risk multiplier (applies to CAPEX of imported equipment)	[ ]	1.2	**2.5**	2.75
PV CAPEX	$/kW	800	**1000**	1900(*)
Diesel life, counterfactual	[ ]	3	**3**	5
Diesel life for optimized system (increment over counterfactual)	[ ]	0	**1**	2
Diesel generator cost (typical 500kVA for small ESP)	$/kVA	400	**477**	800(*)
reduction in technical losses (% generation)	[ ]	5%	**8%**	12%
PV system output uncertainties (as multiplier)	[ ]	0.8	**1**	1

(*) upper bounds from PSMP

18. The analysis shows that the probability of the ERR falling below a 10 percent hurdle rate is less than 5 percent, and of falling below a 4 percent discount rate less than 1 percent. The probability of not meeting the hurdle rate is even lower when GHG emissions are included in the NPV calculations.

Carbon accounting

19. GHG accounting is integrated into the economic analysis, based on lifetimes of 15 years (corresponding to typical 15-year PV warranties). Since diesel consumption (and hence GHG emissions) is a strong function of loading, the savings are based directly on reductions in diesel fuel rather than the usual default IFI/IPCC default values for emission factors. Lifetime GHG emission reductions are estimated at 2.37 million tons CO_2. Valuation at the low and high valuations stipulated in the Bank's Guidance document increases the economic returns as shown in table 3.6.

Financial analysis

20. Components 1 and 2 involve ESPs, about whose financial statements there is no information. The impact of the projects on the financial condition of the ESPs cannot be assessed. The financial analysis therefore captures just the well-defined incremental cash flows. Under the proposed implementation model for component 2 (PV hybridization), ESPs would purchase PV generated power from the design, supply, and install (DSI) contractors for the first five years, then taken over by the ESP. However, assessment of the transfer price between the DSI and the ESP is not possible at this stage, so the financials assume the entire project be implemented by the ESP. Such a financial assessment is not appropriate for the health centre and school SHS (component 3), which generate no offsetting revenue from users.

Table 3.6: GHG Emission Benefits and Economic Returns Including GHG Damage Valuations

				lifetime	2023	2024	2025	2026	2027	2028	2029	2030
				sum	0	1	2	3	4	5	6	7
[1]	**GHG emission impacts by component**											
[2]	Synchronisation		[ktons]	-292	0	-2	-6	-16	-19	-19	-19	-19
[3]	System rehabilitation		[ktons]	-1,276	0	0	-1	-6	-20	-42	-72	-98
[4]	PV Hybridisation		[ktons]	-398	0	-3	-8	-21	-27	-27	-27	-27
[5]	Electrification		[ktons]	-406	0.0	0.0	-3.8	-13.5	-27.1	-27.1	-27.1	-27.1
[6]	**Project total**	**0**	[ktons]	-2,372	**0**	**-5**	**-19**	**-56**	**-93**	**-115**	**-145**	**-171**
[7]	SVC low		[$/ton]		**43.7**	**44.7**	**45.7**	**46.7**	**47.8**	**48.9**	**50.0**	**51.1**
[8]	*GHG emission benefit*											
[9]	Synchronisation		[$USm]	10	0.0	0.1	0.3	0.7	0.9	1.0	1.0	1.0
[10]	System rehabilitation		[$USm]	43	0.0	0.0	0.1	0.3	1.0	2.0	3.6	5.0
[11]	PV Hybridisation		[$USm]	14	0.0	0.1	0.4	1.0	1.3	1.3	1.3	1.4
[12]	Electrification		[$USm]	14	0.0	0.0	0.2	0.6	1.3	1.3	1.4	1.4
[13]	total project		[$USm]	80	0.0	0.2	0.9	2.6	4.5	5.6	7.3	8.8
[15]	*Adjusted economic flows*											
[16]	Synchronisation	53%	[$USm]	62	-1.5	-2.4	-5.7	4.1	8.3	13.0	1.5	6.1
[17]	System rehabilitation	45%	[$USm]	413	-6.2	-13.7	-33.1	-1.5	23.2	69.5	11.5	47.4
[18]	PV Hybridisation	49%	[$USm]	77	-2.0	-3.1	-7.4	4.3	10.1	12.8	6.1	8.8
[19]	Electrification	23%	[$USm]	56	0.0	-5.6	-13.1	-15.3	9.4	9.4	9.4	9.5
[20]	**total project economic flows**		**[$USm]**	608	**-10**	**-25**	**-59**	**-8**	**51**	**105**	**28**	**72**
[21]	ERR, low SVC		[ ]	42.4%								
[22]	SVC high		[$/ton]		87.4	89.4	91.4	93.5	95.6	97.7	99.9	102.2
[23]	GHG emission benefit		[$USm]	160.3	0.0	0.4	1.7	5.2	8.9	11.2	14.5	17.5
[24]	**total project economic flows**		**[$USm]**	697	**0**	**-25**	**-58**	**-6**	**55**	**110**	**36**	**80**
[25]	ERR, high SVC		[ ]	51.6%								

21. Table 3.7 summarizes the financial analysis for the three main project types. Financial returns are somewhat lower than the economic ERRs (as expected, attributable mainly to an 18 percent import duty on CAPEX), but highly profitable to the ESPs. However, the extent to which the substantial cost savings of hybridization to the ESP is passed onto consumers will need to be negotiated on a project specific basis. These are for the representative projects as noted.

Table 3.7: Summary of Financial Analysis, Typical ESP Projects

Component	ESP size	FIRR Real [a]	Payback year (year)	NPV[b] (US$ million)	Tariff Reduction[c] (%)
1A: Generator Synchronization and Automation	2000	40%	3	1.1	4%
1B: Sub transmission and Distribution network interconnection in the major load centers	2000	33%	3	1.8	9%
2. Hybridization	1000	39%	3	1.2	6%

Notes

(1) Based on an assumed WACC of 12 percent
(2) Pretax returns
(3) Defined here as the year in which cumulative cash flows first appear positive.

22. The transition from diesel to PV has little impact on the government's tax receipts (as may occur in other

countries where diesel attracts significant tax). With synchronization and automation, the interval between diesel replacement lengthens, so there will be some small decrease in the 18 percent import duty levied on diesel. On the other hand, this same import duty will presumably also be levied on PV imports. The above estimates do not include the impact of income or business taxes levied on ESPs, which currently are ad hoc, without any uniform federal income tax levied on businesses. Efforts at federal tax reform are ongoing, and if implemented, they may well decrease the realizable net financial benefits to ESPs and consumers—though the returns are sufficiently high that any future taxes at conventional rates do not threaten the long-term sustainability of the projects.

Tariff reductions

23. The extent of the potential ESP tariff reduction will depend on the proportion of the total ESP revenue requirement that is made up of diesel fuel, and on the profitability of the ESP. For the hybridization and rehabilitation much will also depend on the financing arrangement of the PV and BESS. The BESS will only be profitable if there is a tariff premium on peak period sales (or if current peak demand cannot be met due to a supply constraint). The analysis makes the following assumptions:

- 35 percent of sales occurs in the 6 peak hours between 4 and 10 pm
- Peak tariff of US$0.82/kWh, off-peak tariff US$0.63/kWh. The weighted average equals the reported average tariff of US$0.70/kWh
- Profitability of the business: 20 percent (as percentage of its revenue requirement)
- Diesel generators are replaced every 3 years in BaU, every 4 years once hybridized and optimized.

Under the above assumptions, minimum tariff reductions are as shown in table 3.7.

Resilience to climate change and assessment of mitigation/adaptation costs

24. Somalia is subject to a range of natural hazards whose frequency and intensity is likely to increase because of climate change. All the proposed interventions are subject to these hazards, but in assessing their impact on economic returns one should note these are relative to the impact of the same scenario on the counterfactual.

Acute hazards

25. The main acute hazard is exposure of project investments to floods. This is strongly dependent on location: southern locations are potentially the most severely affected by flooding from severe storms even at some distance from the coast. In the counterfactual, the worst-case flood damage would be the need for completely new diesel generators and replacement of control equipment. However, given that diesel generator CAPEX is small compared to running costs, even if diesels were added or replaced as part of the project modernization, the impacts can be expected to be small.

26. Other consequences that may give rise to adaptation costs:

- Increased sand and dust from sandstorms in the northern areas of Somalia may necessitate additional annual cleaning (the Good Practice Guide suggests costs of US$1.30/kW-year (so US$2.90/kW with the Somalia Multiplier).

- Diesel generators may need protection of physical structures or higher elevations against flood damage. This will be highly location specific (and may not be needed at all): we assume here a onetime cost of 20 percent of CAPEX.
- PV sensitivity to high winds, mitigated by stronger support platforms: more robust design leads to a 15 percent higher balance of system cost for PV CAPEX.
- Distribution rehabilitation and rationalization: increase CAPEX by 10 percent for more robust design against wind and flood (though again strongly dependent on location, but applied to all for sake of conservative calculation)

Chronic impacts

27. The main chronic impact is the gradual increase in temperature. The Somali National Adaptation Program of Action on Climate Change (NAPA), issued in 2013, suggested that mean average temperatures in Somalia would rise by 3.2^{o}C in 2080.[45] Temperature increases will have two main consequences for the SESRP:

- PV output decreases with increasing temperature, so to maintain a given level of kWh implies larger panel area, modelled as an increase in CAPEX. However, there is considerable variation in the temperature coefficients depending on the type of PV cells. A worst-case temperature gradient of 0.5 percent power drop per ^{o}C is assumed.[46]
- Diesel power output also decreases with increases in ambient temperature, that can be similarly modelled as an increase in CAPEX. Manufacturers' specifications sometimes provide for running at up to 60 ^{o}C, but in general the literature suggests thermal gradients of between 0.3 to 0.5 percent loss per ^{o}C. For example, the Egyptian code specifies de-rating factor around a 40^{o}C baseline of 1.053 for 50^{o}C and 0.952 for 30^{o}C.[47]

28. The approach for incorporating resilience and adaptation costs into economic analysis of power sector investment projects is under preparation. Costing some of the adaptation measures is the easy part (as noted above, annual cleaning in response to increased sand and dust deposits on PV panels is easily costed), but identifying the time path probabilities of increased dust and sandstorms is difficult. Costing of other measures – such as protective dykes to protect a diesel generator against urban flooding is difficult in our case when we have so little information about the actual locations (and proximity to floodplains) of ESP generators.

29. Even more difficult is stipulating the time path of climate change. Many assessments in the literature (particularly hydro projects, arguably the most studied of impacts of energy projects to climate change) note the uncertainty of global climate modelling in forecasting temperature and precipitation changes and are often reluctant to define how fast the changes would occur. If one has a project life of 15 years it matters a great deal

[45] The World Bank Climate Change Knowledge Portal states mean annual temperature rise of 1.6^{o}C by 2040-2059, and by 3^{o}C across all areas of Somalia by the end of the century.

[46] The literature is reviewed by J. Kaldellis, M. Kapsali, and K. Kavadias Temperature and wind speed impact on the efficiency of PV installations. Experience obtained from outdoor measurements in Greece, Renewable Energy, 66 (2014) 612-624. They report a temperature gradient of 0.40-0.45 for c-Si modules, down to 0.2% for amorphous Si modules.

[47] A. Esebaay, M. Adma and M. Ramadan, *Analyzing the effect of ambient temperature and loads power factor on electric generator power rating,* International Journal of Electrical, Computer and Communication Engineering, Vol 11, No.27, 2017.

whether a severe climate change scenario will happen by 2050, by 2070, or by 2100. Whether a proposed adaptation measure is economic obviously depends on when the risk against which it protects will occur.

30. A further peculiarity of the diesel systems operated by ESPs is their short lives. A diesel operated in wet stacking conditions will need to be replaced every 3-4 years anyway, so the impact of a total loss in, say, year 2 for of its life - caused by urban flooding – makes the need for major adaptation investments less compelling.

31. One should note that calculations of expected values of disaster impacts – based on some assumed return period – underestimate the potential impacts on economic returns. Thus if, for example, a 20 year flood would destroy a generating station, calculating the impact as a corresponding expected value does not capture the actual impact on returns were that event to occur, say, in the second or third year of operation. The financial impact on an ESP would be greater still.

32. The framework for assessing the impact of climate change and disaster resilience has the following steps:

- Calculation of economic returns under baseline conditions
- Definition of a plausible scenario for chronic impacts of severe climate change (such as higher ambient temperatures) combined with a disaster occurring in the early years of a project – in our case, for example, a flooding event that requires replacement of the diesels, control equipment and transformers in year 2 of operation – in both the with and without project cases.
- For the project case, add the adaptation costs that would avoid the impact of the disaster, and mitigate the chronic impacts.
- Assume that the adaptation costs are also implemented in the counterfactual

33. The methodology has been applied to a typical PV hybridization project, with the results shown in Table 3.8 (other projects would have similar results). The ERR in step 2 decreases from 43 percent to 33 percent given the assumption of a flooding event in an unprotected site. The event is assumed to occur as well in the counterfactual. Under step 3 we assume the hybridization project implements flood protection measures for the site, and stronger PV panel supports, leading to an increased ERR of 56percent - higher than in the baseline step 1. The increased ERR is because in the counterfactual the site remains unprotected against the flood event. If one assumes that the counterfactual also involves building a flood protection, then the ERR reduces to 43 percent. Thus, even under conservative assumptions, the ERR is unaffected despite the upfront adaptation expenses. Whether the additional expense would be warranted can only be assessed once the details of the site are known.

Table 3.8. Impact of Climate Change and Adaptation Costs

	Step 1	Step 2	Step 3	Step 4
	Baseline No climate	Baseline + damage costs With climate	+adaptation costs With climate	+adaptation costs +counterfactual mitigation With climate change

	change	change	change	
ERR	43%	33%	56%	43%
NPV, US$ million (4% discount rate)	2.5	1.90	2.61	2.27

34. We conclude that notwithstanding the high level of uncertainty in the input assumptions, the resilience of the proposed project interventions to severe climate change is high. The worst-case climate change scenario - in which a disaster event occurs in year 2 - does not threaten the economic viability of any of the proposed project investments.

ANNEX 4: Gender Action Plan

1. **Overview.** Gender inequality in the county is prevalent; The major causes of gender inequalities include illiteracy, which affects 75 percent of women, and social and cultural norms, which define how women and men are treated from early stages of life, in family settings, and in the community at large[48]. Further, the inequalities have been influenced by civil conflicts, political instability, extreme poverty, prolonged droughts, food insecurity, limited access to health services, and negative religious and cultural practices. As a result of the prolonged war and conflict in Somalia, female-headed households in Somalia are reported to range from 44 percent to 66 percent,[49] and such households are more likely to be poor and vulnerable. Data and statistics regarding gender gaps, including in the energy sector, are very limited, representing a constraint to tackling such issues. However, available data shows the gap is wide. In the Gender Inequality Index (2012) report, the country registered a score of 0.776 (with a maximum of 1 denoting complete inequality), placing Somalia at the fourth highest in gender inequality globally. Moreover, women in the country are being affected more by conflict and violence, inhibiting their potential to exit poverty. The energy sector represents a channel to invest in gender equality and foster positive development outcomes[50].

2. **Demand-side**. Approximately 97 percent of urban households in in the country depend on biomass fuels such as charcoal for cooking and other household needs, while rural households depend on firewood[51]. The burden of cooking and searching for fuels for cooking tends to fall on women and girls in the household. The use of firewood impacts the health of women negatively for several reasons, including exposure to indoor pollution. In addition, searching for firewood and charcoal is time consuming. As a result, lack of access to reliable and clean electricity limits women's ability to engage in economic activities and negatively affects the income-generating capacity of those women engaged in productive activities. For instance, end-use appliances that could increase productivity of women-owned businesses require modern energy such as electricity, and the lack thereof results to productivity losses. Further, lack of reliable and quality electricity service impacts the delivery of public services that positively affect women. For instance, lack of street lighting makes women vulnerable to gender-based violence GBV), especially if the women work late hours. During the consultations in Somaliland, most women indicated they are home by 7pm due to lack of street lighting. Limited access to reliable electricity in public facilities and institutions also hinders socioeconomic development. In Somalia, public schools lack access to electricity due to affordability. In addition, health facilities that do not have access to electricity are not able to provide quality nighttime health service such as child delivery, which has contributed to the increase of high maternal mortality rates of 732 deaths per 100,000 births in Somalia.

3. **Supply Side**. Approximately 23.1 percent of women between the age of 15 and 64 are working in Somalia[52] when compared to 76.3 percent for men[53]. While the proportion of women graduates with STEM degrees is less

[48] UNFPA Somalia (2016), 'Population Estimation Survey 2014, Analytical Report Vol. 2
[49] UNFPA Somalia (2016), 'Population Estimation Survey 2014, Analytical Report Vol. 2
[50] UNFPA Somalia (2016), 'Population Estimation Survey 2014, Analytical Report Vol. 2
[51] UNFPA Somalia (2016), 'Population Estimation Survey 2014, Analytical Report Vol. 2
[52] International Labour Organization. "Labor Force Participation Rate, Female (percentage of Female Population Ages 15–64) (modeled ILO estimate): Somalia." World Bank data. https://data.worldbank.org/indicator/SL.TLF.ACTI.FE.ZS?locations=SO.
[53] International Labour Organization. "Labor Force Participation Rate, Female (% of Female Population Ages 15–64) (modeled ILO estimate): Somalia." World Bank data. https://data.worldbank.org/indicator/SL.TLF.ACTI.FE.ZS?locations=SO. O

than 10 percent, the number of women graduates in STEM fields increased by 19 percent from 2009 to 2013 when compared to a 9 percent increase in women graduates with non-STEM[54] degrees. However, the employment of Somali women in STEM fields lags behind that of men. Cultural and social norms govern women's employment especially in the energy sector, as the norms determine what constitutes acceptable forms of work and employment for women and for men. Somali women employed in the energy sector work mostly in administrative and nontechnical fields, while the technical fields tend to be male dominated. As gender norms are changing, Somali women are now entering vocations that have been predominantly male, including engineering and technical positions. However, negative perceptions of women in technical positions could hinder women from being gainfully employed in the energy sector. Persistent gender barriers and lack of equal opportunity strategies, policies and legal frameworks negatively impact the retention of women employed in technical fields in the energy sector[55]. Consultations showed that electricity service providers (ESP) viewed employment of women engineers as a risk due to potential work gaps that might occur when women take maternity leave or care for family needs. While the Somalia, Somaliland, and Puntland ESPs have maternity leave policies, policies to provide work-life balance are lacking reinforcement, especially in the private sector. ESPs also expressed issues of safety when women engineers work in the field, as women's cultural profile presents safety risks. While women-owned ESPs are more likely to employ women engineers, only 6 percent of ESPs are owned by females in Somalia. The FGS and government of Somaliland are cognizant of the existing gender disparities, such that the Somalia Ministry of Energy and Water Resources (MoEWR) and Somaliland Ministry of Energy and Minerals (MoEM) have started the integration of genders in the energy sector, but the process is in early stages.

4. The Gender Action Plan for this project is designed to close the gender disparities in employment in the energy sector by challenging gender and social norms associated with women studying and pursuing careers in STEM fields. The gender actions to address gender disparities are (i) conducting detailed multisectoral diagnostic gender assessment; (ii) pilot incubator for women's employment; (iii) Gender Capacity Building plans will be developed to ensure that women in Somalia and Somaliland are fully engaged in the opportunities provided by the energy sector, leading to socioeconomic development of both countries.

a) Detailed Gender Diagnostic Assessment. Understanding the specific gender gaps of the energy sector is critical to designing interventions that narrow the existing disparities. Given that the constraints are evident throughout the lifecycle of a woman, MoEWR and MoEM conducted a gender diagnostic assessment that identified four critical areas to focus on in order to increase women's employment in the energy sector: pipeline (education), skills training, employment entry and retention, and policy and legal framework. Plans are under way to conduct a detailed multisectoral diagnostic gender assessment in addition to the employment sector.

b) Pilot incubator for women's employment. Based on the diagnostic gender assessment, it was evident that women graduating in STEM fields lack the skills that would facilitate employment in the sector. The pilot incubator will be a training facility under MoEWR and MoEM that will provide hard and soft skills to women who have graduated in STEM fields. The facility will also provide training to employers in the energy sector to ensure their human resource policies and work environments are conducive to helping

[54] Somali STEM Society. "Welcome to Somali STEM Society." http://www.somalistemsociety.org/
[55] Somali STEM Society. "Welcome to Somali STEM Society." http://www.somalistemsociety.org/

women engineers succeed. The pilot incubator will also provide placement services to assist women with employment search as well as track the employment records of the women who received training through the incubator.

c) Detailed Gender Action Plans. Upon the completion of the Gender Diagnostic Assessment, Detailed Gender Action Plans will be developed, under the MoEM and MoEWR to address closing the gender gaps identified in the assessment. In addition, Gender Capacity Building plans will be developed to ensure that women are fully engaged in the opportunities provided by the energy sector, leading to socioeconomic development of both countries.

5. **Gender Actions.** MoEWR and MoEM have conducted gender diagnostic assessments to identify specific gender gaps within the energy sector particularly barriers that limit career progression of women within the energy sector. The assessments have identified four critical areas that should be considered: (a) pipeline (education sector), (b) skills-training, (c) women's employment and retention in the energy sector, and (d) the policy and legal framework to support women's employment. The Project Implementation Units (PIUs) have developed terms of reference (ToR) to hire local focal points for gender issues in Somalia and Somaliland to support the development of Gender Action and Capacity-Building Plans and support gender integration during project implementation. In order to close the gender disparities between the skills of women engineer graduates and men and increase the gender capacity in the energy sector, the MoEWR and MoEM will pilot a Women in Energy incubator and accelerator for women's employment. It will help bridge the gap between graduation from university and employment by training women engineers with soft and practical skills to work in technical fields within the energy sector. The incubator concept was motivated by the Women in Energy internship program, which was piloted in 2016 by the USAID-sponsored Growth, Employment, Enterprise and Livelihood (GEEL) project to prepare women engineering graduates for employment; the program will end in September 2021. The GEEL program's main objective was to bridge the gap by providing women with internship opportunities with ESPs to acquire practical skills for working in the sector. While the GEEL project was not evaluated, consultations showed increased competency and self-confidence among interns. The incubator participants will be provided mentoring, networking, coaching opportunities, leadership training, and other soft skills that will help women engineers to advance career ladders to management positions within the sector. It will also provide placement services and track the employment of the program participants, an aspect not offered in the GEEL program. In addition, the program will work with the ESPs and other employers in the energy sector to provide environments that are conducive to women engineers thriving, including providing flexible work schedules. The project plans to work with stakeholders in the legal and policy arena to provide a framework conducive to women engineers' career advancement. Studies show that removing barriers that constrain women from entering technical fields, where the income is higher than in traditional female-dominated fields, would result in a win-win situation for women and the enterprises. However equal opportunity policies and strategies need to be implemented. The grievance redress mechanism for the project will also include gender-sensitive channels to ensure women are able to submit their grievances, especially in situations of GBV, sexual exploitation, and abuse. **Table 4.1** and 4.2 summarize the Gender Action Plan by project component.

6. **Monitoring and Evaluation**. The monitoring and evaluation will include intermediate indicators as follows: (a) the number/percentage of women and men engineering graduates employed in the energy sector (Women's

Employment), (b) completion of Diagnostic Gender Assessment, and (c) design and implementation of Women of Energy Incubator (Yes/No). The other indicators to track progress include number/percentage of female graduates admitted to the Women of Energy Incubator, number/percentage of ESPs employing women engineers, and Gender Action Plan or Gender Capacity-Building Plan (Yes/No). The intermediate indicators will be included in the Results Framework, while the remaining indicators will be included in the Project Operations Manual. The grievance redress mechanism will collect sex-disaggregated data to ensure that the grievances affecting women related to the project are addressed accordingly. Tables 4.1 and 4.2 show the results indicators by project component.

Table 4.1. SESRP Gender Action Plan

KEY GENDER GAPS	ACTIONS	INDICATORS	EXPECTED OUTCOMES	RESPONSIBLE UNIT
Component 3 – Electricity services for improved public services delivery (Health and Education)				
Health facilities lack reliable electricity needed to provide healthy deliveries leading to high maternal mortality rates	Prioritizing electrification of health facilities that provide maternal health services	Number of women receiving quality maternal health care	Decrease in maternal mortality rates	MOEWR, MoEM in partnership with Ministry of Health
Public education facilities lack reliable electricity, which limits learning opportunities for women	Prioritize electrification of tertiary educational facilities that provide non-formal education (NFE). Develop incentives for TVET institutions to provide access to women to study STEM courses	Number of women graduating from non-formal education courses and tertiary institutions Number of women enrolled STEM fields in vocational training (TVET) institutions	Decrease in illiteracy rates among adult women	MOEWR, MoEM in partnership with Ministry of Education
Component 4: Build Capacity for Gender Integration in the Energy Sector				
The Ministry does not have gender action plan, gender capacity building plan and a gender strategy	Complete a detailed Gender Diagnostic Assessment	Detailed Gender Diagnostic Assessment completed	Develop Gender Action Plan Develop Gender Capacity Building Plan Develop a gender strategy Gender Compendium to the Electricity Act	MOEM, MOEWR

Table 4.2 Component 4 - Gender Action Plan based on Preliminary Gender Diagnostic Assessment of the Employment Sector (additional actions under Component 4)

Area of assessment	Key Gender Gaps	Actions	Indicators	Expected Outcomes	Responsible Unit
Pipeline (education)	Underrepresentation of women studying science, engineering, technology and mathematics (STEM) in higher education institutions	Ministry-oriented career activities to promote opportunities for women in the energy sector Work with higher education institutions to provide incentives, such as scholarships, to increase number of women studying STEM fields	Number of women graduating with STEM degrees	Increase in number of women graduating with STEM degrees, especially electrical engineering	MoEM, MoEWR In partnership with Ministry of Education
Skills Gap	Women engineering graduates do not have adequate skills to work in technical positions in the energy sector	Implementation of a pilot Women in Energy Incubator/training program to provide practical and soft skills, mentoring and placement services to women who graduate with electrical engineering degrees.	Number of women with STEM fields enrolled and graduating from incubator/training program Number of women engineers entering the energy sector	Increase in number of women graduating with electrical engineering degrees entering the energy sector	MoEM, MoEWR
Employment	Human Resource (HR) policies in the private sector are not conducive to women's employment	Consultation with Electricity Regulation Commission (Somaliland) to review policies affecting women's employment in the energy sector Develop a comprehensive strategy to engage ESPs to mainstream gender	Assessment of HR policies supporting women's employment in the private sector	Public-private dialogue on human resource policies conducive to women's employment in the energy sector	MoEM, MoEWR
Policy	Lack of policy and legal framework supporting women's employment	Technical assistance to review legal and policy framework for women's employment in the private sector Consultation with women's groups on the policy and legal framework for women's employment	Assessment of policy and legal framework supporting women's employment	Public-private dialogue to support policies conducive to women's employment in the energy sector	MoEM, MoEWR, In partnership with Ministry of Labor

ANNEX 5: Donor Activities

1. The United Kingdom's Foreign, Commonwealth & Development Office (FCDO) is financing £20 million in technical assistance to the government of Somaliland through the Energy Security and Resource Efficient in Somaliland (ESRES) project. This includes hybridization of six minigrid projects, with a focus on reducing losses (technical and commercial) and the potential for scaling up through the Somaliland Renewable Energy Fund (SREF), which will support electricity service providers in developing more hybrid minigrids and possibly support captive users such as water authorities and hospitals.

2. The African Development Bank (AfDB) has considered an investment program for Somalia's energy sector.[56] It is also currently in discussion with the Federal Government of Somalia (FGS) to support the creation of the Somali Electrification Institute, which would serve an independent federal regulatory body with a presence in each Federal Member State for financing the electrification effort.

3. The US Agency for International Development, under its Growth, Enterprise, Employment, and Livelihoods (GEEL) project, has supported loss reduction measures in selected energy services providers in Somaliland. Power Africa is considering supporting activities in energy policy and regulatory reforms, strengthening energy sector donor coordination, strengthening utilities (loss reduction), and unlocking investments in solar hybrid generation through a credit guarantee.

4. The United Nations Development Programme is supporting the FGS to strengthen the capacity of the Energy Coordination Unit (ECU). This entails development of an investment climate report for the energy sector based on the country's Power Master Plan and in line with the National Development Plan. It has also included the planning of the Somalia Energy Investment Forum 2020 to fast-track investments in the renewable energy sector.

5. The Swedish Embassy is supporting a four-year energy sector development program. This follows a strategy of shifting focus from Somaliland into the wider south-central area of Somalia, where there are greater needs. The Swedish International Development Agency is providing financing for the Renewable Energy, Adaptation and Climate Change Technology sub-Saharan Africa Sub-Saharan Africa (REACT SSA) Somalia program, with the Africa Enterprise Challenge Fund (AECF) as implementing agency.

[56] The Somalia Infrastructure Trust Fund for AfDB's Project Pipeline proposed construction of medium voltage grid for Baidoa, Burao, and Kismayu. It had also proposed the repair and rehabilitation of distribution lines in Qardho, Hobyo, and Galkayo. AfDB also proposed a household energy project for Mogadishu and clean cooking solutions.

ANNEX 6: Least Cost Geospatial Electrification Plan to Achieve Universal Access in Somalia

1. The 2021 Least Cost Geospatial Electrification analysis outlines different scenarios for achieving universal electricity access by 2030 in Somalia using an integrated approach to technology deployment, encompassing grid, minigrid, and solar home systems (SHS) solutions. The scenarios considered were informed by the recommendations of the 2019 Power Master Plan for the establishment of a national integrated power infrastructure. They include (a) business as usual (minigrids and SHS only), (b) establishment of a subregional transmission backbone, and (c) establishment of a national transmission backbone. The scenarios were developed to identify options for the nation-wide optimal deployment of technologies and their investment requirements, informed by the availability of endogenous renewable resources.

2. The technologies considered are depicted in table 6.1. The methodology applied followed three main steps: (1) Identification of settlements and priority service delivery facilities, (2) demand estimation, and (3) comparison of electricity supply options. By 2030, about 21 million people will require access to electricity services, whether through grid, minigrid, or off-grid solutions.

Table 6.1. Five Technology Configurations Employed in the Analysis

Category	*Definition*	*Supply technology*
Grid-connection (Grid)	*Connection to a future potential national grid.*	*National Grid*
Minigrid systems (MG)	*A system with its own distribution network operating independently of the national grid serving multiple customers*	*Solar PV/Diesel hybrid*
		Wind/Diesel Hybrid
		Hydropower
Stand-alone systems (SA)	*An energy system serving one single customer.*	*Solar PV (Solar Home Systems)*

3. The summary of results for each scenario considered is presented in table 6.2. The investment requirements for the non-business-as-usual (BAU) scenario are higher as they include the costs of establishing the transmission backbone and substations and added generation capacity needed. They therefore exclude the investments and power trade contribution to the establishment of the transmission backbone offered by regional integration. They also exclude the full least-cost optimization offered by an integrated grid rollout and related economies of scale. These analyses will be conducted under component 4 in SOP I.

Table 6.2. Summary of Technology Options and Investment Requirements, by Scenario and Beneficiary

Scenario	Technology	Investment needs, US$ million	People connected, million	Health facilities, %	Education facilities, %	Water points, %
Business as Usual	Mini-grids	1,400	9.6 (brownfield) + 2.3 (greenfield)	55	70	21
	SHS	440	9.2	55	30	79
	Total	**1,840**	21.1	100	100	100
Sub-regional transmission backbone	Grid	920	6.2	35	35	5
	Mini-grids	1,260	5.7	38	38	15
	SHS	430	9.1	27	27	80
	Total	**2,610**	21.1	100	100	100
National transmission backbone	Grid	1,480	7.5	25	42	10
	Mini-grids	1,220	4.5	30	25	10
	SHS	430	9.1	45	33	80
	Total	**3,130**	21.1	100	100	100

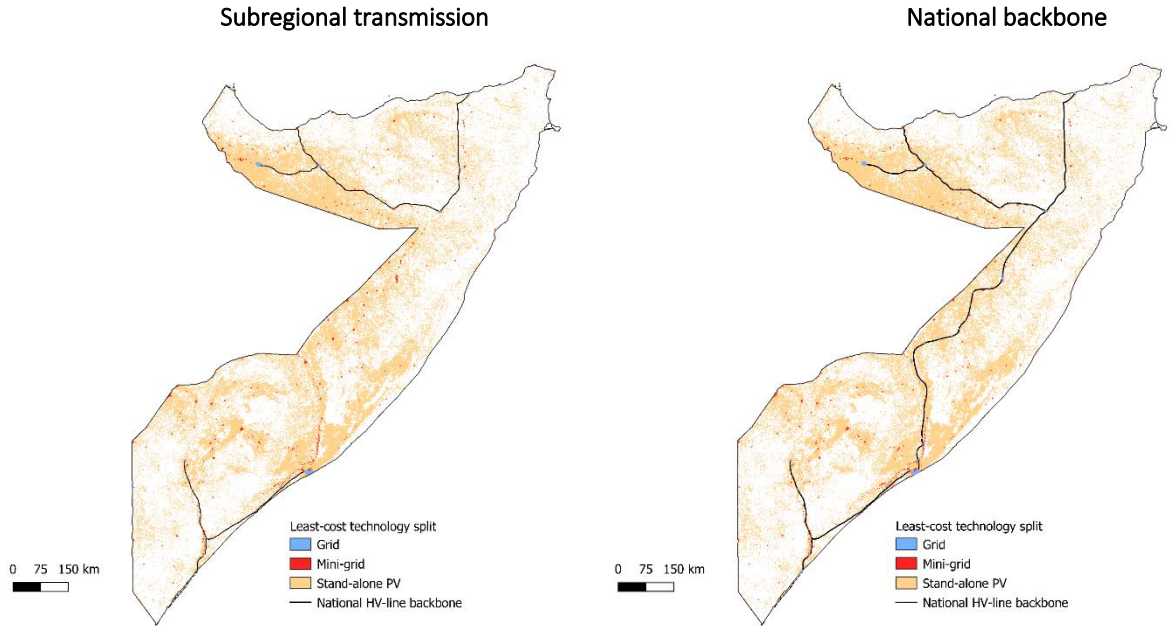
Source: MoEWR, MoEM, 2021

4. The BAU scenario also highlighted the potential for integrating existing minigrids to optimize access provision and decrease connection costs, compared to the establishment of greenfield minigrids. In fact, about 8 million people live in locations where there is already an existing medium voltage network, and an additional 200,000 people could be connected at an average of US$130 rather than average US$600 estimated for connectivity to an existing or greenfield minigrid. As also highlighted by the 2019 Power Master Plan, the establishment an integrated national infrastructure offers significant potential cost-savings through generation and distribution network optimization, economies of scale, and regional integration with neighboring countries.

5. The "series of projects" and national sector development approaches are considering the opportunities offered by the establishment of a transmission backbone in the country, where the subnational one would require fewer investment needs (about US$760 million compared to the US$1.3 billion required for the national transmission backbone). Additionally, opportunities offered by regional integration for the cofinancing of transmission infrastructure development and savings stemming from power imports (compared to the development of endogenous generation only) are also being considered.

6. Remarkably, both scenarios including the establishment of a transmission backbone indicate investment needs for about US$1.2 billion in greenfield minigrid development. Similarly, US$430 million investments will be required to deploy SHS. These result from (1) remoteness of load centers from the grid infrastructure and (2) urgency of providing universal access to the Somali population by 2030, whereas the full establishment of a national grid infrastructure will require a longer timeframe. Map 6.1 depicts the technology breakdown for universal access by 2030 considering efforts for the reestablishment of a national grid.

Map 6.1. Least-Cost Technology Options for Universal Access with the Establishment of the Subregional Transmission or National Backbone Infrastructure



Source: MoEWR, 2021

ANNEX 7: Climate Vulnerability Context

1. A major challenge facing Somalia and one cause of internal displacement is climate-related hazards and shocks, including drought and flooding. In 2019, combined impacts of flooding, drought and locusts resulted in an estimated 5.2 million persons in need to assistance, at a cost estimated at 16.5 percent of gross domestic product.

2. Climate-related hazards and shocks are expected to increase in frequency and severity, causing increasing challenges to the nearly half of the population relying on pastoralism, agriculture, and related livelihoods. Somalia generates low greenhouse gas emissions (just over 1 percent of global emissions) but was the seventh most vulnerable country to climate change (179 out of 188) in 2018. The greatest contributors to this score are very high vulnerability in agricultural capacity, low control of corruption, and low regulatory and legal quality. National-level estimates for climate changes vary widely but show a median increase in temperature exceeding 3°C by the end of the century, with the 90th percentile estimates as high as nearly 6°C. Changes in precipitation show a median value with little deviation from current levels except for slight increases in October–December. These changes may exacerbate existing natural hazard events (presented in table 7.1), including high risk levels for flooding, landslides, extreme heat. and wildfires in many regions.

Table 7.1. Hazard Risks, according to ThinkHazard, for Somalia (National) and Selected Regions with Current and/or Planned Electricity Infrastructure

Hazard Risks						
	River Flood	Urban Flood	Coastal Flood	Landslide	Extreme Heat	Wildfire
Somalia	***High***	***High***	***High***	***High***	***High***	***High***
Shabelle Hoose [Mogadishu]	*High*	*Very Low*	*High*	*Very Low*	*Medium*	*High*
[Hargeisa, Berbera]	*Low*	*Low*	*Medium*	*Low*	*High*	*High*
Juba Hoose [Kismayo]	*High*	*Very Low*	*High*	*Very Low*	*High*	*High*

3. Access to infrastructure is very limited among rural populations and nomadic persons, with notably low access to education, markets, and health clinics. These challenges disproportionately impact women, with lower rates of literacy, educational attainment, and participation in the labor force. Low rates of electricity access result in high use of biomass fuel, which contributes heavily to deforestation and environmental degradation. Petroleum products are used primarily for transportation and electricity generation, accounting for approximately 10 percent of energy use.

Climate Change and Natural Hazard Risks

4. As noted in Table 7.1, Somalia is at high risk for flooding (urban, river and coastal), wildfires, extreme heat, and landslides, although these risks do vary geographically. Changes in climate may exacerbate these issues, especially related to extreme heat, drought and other temperature-related hazards. Each of these hazards poses challenges for consideration in the design, construction and operation of the project assets.

Project Resilience Considerations

5. The project includes four components to connect and augment existing generation and distribution infrastructure, expand technical and organizational capacity, integrate the existing infrastructure and promote cleaner electricity generation. There are many aspects of this project that enhance the resilience of the existing power network in Somalia, with a heavy focus on resilience-building through a set of investments focused on integration and capacity building.

Resilience "of" Project Considerations

6. The resilience of this project to climate change and natural hazard impacts will depend on the specific materials chosen for the construction (and reconstruction) of assets, the siting of the infrastructure, and the operation and maintenance schedules followed. As detailed in the preceding hazards section, selecting the transmission and distribution lines with steel tubular poles and/or concrete will increase their resistance to damages from flooding, wildfires, and other hazards. These options will be considered during project implementation and following adequate studies. An additional aspect of the project that increases the resilience to future challenges is the selection of renewable energy generation sources, which allows for the expansion of generation technologies not reliant on solid, high-emissions-generating fuels sources. However, to ensure of the sustainability of the intervention, as noted in the PAD, special attention will be paid to the issues related to the lack of supply chains and procurement mechanisms, especially related to the supply of photovoltaic and battery systems and local capacity.

Resilience "through" Project Considerations

7. The focus of this project is on enhancing the resilience of the electricity industry in Somalia and laying the building blocks for integration with current regional projects as well as future investments. This entails financing and organization within Somalia at the government levels for regulation and operation, as well as at the level of the populations that would benefit from increased electricity reliability and availability. Specifically, this project includes the reestablishment of the Somalia electricity supply industry, including creation of policy, legal, and regulatory frameworks that would lay groundwork for the investments in this project as well as all future endeavors. Many of these aspects of the project can be considered to enhance the resilience "through" the project.

8. Component 3 focuses on electrification for priority facilities (health and education). Reliable and adequate electricity at these key facilities will have quantifiable benefits for human and rural development. In addition, component 4, "Sector capacity enhancement and project implementation capacity support" specifically aims at increasing the technical, organizational, operational, and other aspects of operations for the electricity services in Somalia. This focus on institutional capacity integration and building complements the investments in components 1 (50 percent of project resources) and 2 (27 percent of project resources). The retrofitting and construction of assets focuses on the synchronization, integration, and improvements in reliability for current operational minigrids. This will provide many benefits, including more reliable and higher levels of electricity access for businesses and homes, lower losses of load (higher operational efficiency), better resilience to fluctuations within the grid, and many other factors. Investments into the renewable generation and battery options may increase fuel efficiency and consumption, extend generator lifespans, reduce emissions, and reduce reliance on fuel imports.

9. Finally, it is noted that this project is complementary to several ongoing and planned projects within the region. In particular, the proposed project lays building blocks that would enable Somalia to potentially join regional power

projects including the Horn of Africa Regional Integration for Sustainable Energy Supply project (P174175) currently under preparation, which includes an important focus on increasing the resilience of the power sector in partnering countries.

Climate mitigation impact of the project

10. Somalia submitted its first nationally determined contribution (NDC) in November 2015 and remains committed to achieve the targets despite its challenges and national circumstances. Consistent with United Nations Framework Convention on Climate Change decisions and guidelines, Somalia has taken steps to prepare and submit a revised NDC to guide its climate action agenda. With the support of the NDC partnership, it has prepared a mitigation analysis report that identifies priorities and costs to inform its upcoming NDC.

11. Sustainable development, energy, and adaptation to climate change remain the highest priority for Somalia. These priorities will have to be translated into actions and strategies, but the country has already adopted some key policy and regulatory frameworks in the past years that will help its transition toward a lower carbon and climate resilient energy sector, including its NDP9 (2020–24) that has an emphasis on reducing deforestation and scaling up clean and renewable energy investments to meet the country's energy demand and drive growth; the National Climate Change Policy (2020) that sets out a low emissions development path and identifies actions in all sectors; and the Energy Policy (2018), which aims to provide all Somalians with adequate, affordable, and sustainable access to efficient energy. Finally, the Somalia Power Master Plan (2019) presents a roadmap for the investments in the energy over a 20-year planning period to meet the country's growing demand, and investments in clean and renewable energy are expected to play a key role.

12. Somalia is one of the countries in Africa that are richly endowed with renewable energy sources (solar, wind, geothermal, hydro). However, these are mostly unexploited (less than 10 percent of the energy mix). The country also has discovered reserves of oil and natural gas, which remain undrilled. Firewood and charcoal consumption, while difficult to precisely estimate, contribute directly to greenhouse gas (GHG) emissions in the energy sector, and inefficient cooking contributes to health complications among the vulnerable population, especially women and children, and exacerbate gender inequalities. As part of the country's mitigation efforts, a strong emphasis is placed on clean and efficient cooking solutions.

13. Through the updated NDC, Somalia has set a target of 30 percent emissions reductions against the BaU scenario by 2030. To achieve this target, Somalia has to reduce its GHG emissions by about 60MtCO2e relative to the BAU scenario by 2030. Specifically, for the Energy sector, Somalia would have to reduce 15.25 MtCO2e to meet the updated NDC target by undertaking the several interventions requiring about US$ 350 M funding over the NDC period (2021-2030). Table 7.2 lists the NDC priority areas along with project's contribution towards their achievement and the GHG emissions reduction expected from the project are detailed in the economic and financial analysis.

Table 7.2. Alignment between NDC priority[57] and Project Component

Energy Sector Targets	Project Components	Linkage
Reduce transmission losses by 10 percent of the current 40 percent losses by 2030	Component 1 – Subtransmission and distribution network reconstruction, reinforcement, and operations efficiency in the major load centers of Mogadishu and Hargeisa (US$ 75 million)	The activities will support investments in reduction of wet stacking with concurrent lower fuel consumption, maintenance costs, and GHG emissions. They will also support investment in the subtransmission, and distribution network infrastructure required to enable generation synchronization in addition to increased network capacity and reduced network losses. The subtransmission network and associated reinforced distribution network lay a foundation for the requisite off-taker infrastructure for large scale incremental future generation (bulk supply points and distribution to consumers)
Development of renewable energy electricity (Solar and Wind) - At least 60MW	Component 2 – Hybridization and battery storage systems for minigrids (US$ 20 million)	This component will support activities aimed at the hybridization and optimization of existing diesel-based generation facilities. It will support installation of Battery Energy Storage Systems (BESS) and solar PV systems at existing diesel-based generation stations in selected load centers. Such hybrid opportunities offer significant improvements in fuel efficiency, fuel consumption, extended generator lifespans, reducing GHG emissions and combustion pollution, along with less reliance on fuel imports.
	Partially from Component 3 – Stand-alone solar off-grid access to public institutions (health and education) (US$ 40 million).	This component will support activities to provide electricity to existing public facilities in rural and peri-urban areas, underpinned by the nation-wide geospatial plan. Key activities under this component include new hybrid minigrids and stand-alone solar PVSPV systems augmented by BESS targeting public institutions as the anchor loads. Where viable they will target associated distribution networks to connect other loads such as SMEs small and medium enterprises and households. Considering that biomass accounts for 96 percent of energy sources, this will help replace biomass and kerosene use.
	N.A.	N.A.

[57] The NDC priorities also include: Clean and energy efficient cookstoves (at least 3 million cookstoves), and renewable lamps replacing kerosene lamps (3 million).

ANNEX 8: IFC Support to Somali Energy Sector

1. Over the past two years, IFC through the Somali Unlocking Sectoral Investment Project (SUSIP) has facilitated the review of the draft Electricity Energy Bill at the Federal Government of Somalia level. The draft law was subjected to extensive internal World Bank Group review, resulting in a detailed gap analysis report identifying areas where the law needs to be strengthened. For example, there is a need to review (a) the proposed institutional arrangements, (b) provisions on funding, (c) arbitrary powers provided for in certain areas, and (d) the anchoring in law incentives relating to the expansion of access and key protections. The bill was approved by the cabinet in December 2020 and is currently in parliament for approval. The law is currently undergoing stakeholder consultations with subsequent trainings scheduled on regulatory reforms. In Somaliland, SUSIP is at present focusing on supporting the Ministry of Energy and Minerals and Somaliland Energy Commission to prepare the electricity subsector secondary regulations through an inclusive public private dialogue platform by providing legal and regulatory framework development support and providing capacity-building support. Table 8.1 shows some of the International Finance Corporation project activities currently being undertaken in Somalia.

Table 8.1 Ongoing IFC Engagement in Somalia

Project Name	Objectives
(i) Somali Unlocking Sectoral Investment Project (SUSIP) (Project is Focused on Somalia and Federal Member State of Somaliland)	Overall SUSIP goal is to facilitate private sector growth and investment in prioritized sectors and localities. The Project aims to address gaps in policy, regulatory, administrative, and institutional frameworks. Specifically, in the respective Energy Sectors in Somalia and Somaliland, SUSIP is providing support to strengthen the legal, regulatory and institutional framework, specifically supporting the government in drafting relevant laws and regulations; (ii); supporting and maintaining a Public-Private Dialogue (PPD) platform to facilitate inclusive stakeholder dialogue on key policies, laws, and regulations.
(ii) SomInvReady (Focused on Somalia)	Aims to enhance investment readiness of firms in the energy sector and increase their capacity to meet investment due diligence requirements, i.e. international standards of Corporate Governance, Environmental and Social standards, Risk Management, Transparency, Financial and Prudential reporting including all other key elements for commercial financing and FDI.
(iii) Somalia Electricity Service Providers (SESP)	Technical assistance for ESPs – Support key ESPs by reviewing their business plans, providing technical guidance for solar PV and battery storage options & reduction of distribution losses. The project also aims to attract international developers interested in investing in the Somalia Power sector and provide support in developing business models that are suitable for the local market.
(iv) Somalia Public Private Partnership (PPP)	Project with the Ministry of Finance that seeks to create a foundation for the private sector participation in the development of targeted infrastructure projects through public-private partnerships (PPPs). The project aims for enactment and implementation of prioritized law/regulations on public-private partnerships and support to the Federal Government to utilize the enacted law and regulations to approve at least two projects for due diligence.