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Republic of Djibouti

United Nations Development Programme

Project Document template for nationally implemented projects financed by the GEF Trust Funds

Project title: Promoting a better access to modern energy services through sustainable mini-grids and hybrid technologies in Djibouti		
Country: Djibouti	**Implementing Partner:** Ministry of Urban Planning, Environment and Tourism (MUET)	**Management Arrangements:** National Implementation Modality (NIM)
UNDAF/Country Programme Outcome: **Outcome 6: Good governance** National and local institutions and actors ensure the effective, efficient and transparent management of public resources for inclusive and equitable development **Outcome 7: Community resilience** Livelihoods of poor rural and peri-urban communities are improved to enhance their resilience to climate risks, shocks and food insecurity **Outcome 8: Equitable development of the regions** The living conditions of the poorest populations are improved for better management and protection of natural resources and ecosystems strengthening resilience and promoting equitable regional development		
UNDP Strategic Plan Output: Development Setting B: Accelerating structural transformations for Sustainable Development. Signature solution 4: Promote nature - based solutions for a sustainable planet		
UNDP Social and Environmental Screening Category: Moderate	**UNDP Gender Marker:** GEN2	
Atlas Project ID (formerly Award ID): 00106644	**Atlas Output ID (formerly Project ID): 00107272**	
UNDP-GEF PIMS ID number: 6202	**GEF ID number: 10051**	

Planned start date: September 2019	**Planned end date: August 2022**
PAC meeting date: 08 August 2019	
Brief project description: The project aims to address the specifics barriers for unlocking (private) investment in the sustainable off-grid sector (solar based mini-grids and Solar Home Systems - SHS) for increased access to reliable and affordable electricity to peri urban and rural areas of Djibouti. The project will provide an enabling environment for investment in sustainable off-grid systems and concepts by developing suitable business models, financial instruments and delivery schemes that are viable and replicable. The project will be implemented through two components (i) Policy and financial instruments, Capacity building, and knowledge management and incentive scheme for sustainable off-grid technologies and delivery models (ii) Showcasing Solar-battery mini-grids.	
FINANCING PLAN	
GEF Trust Fund *or LDCF or SCCF*	USD 863,242
UNDP TRAC resources	USD 300,000
(1) Total Budget administered by UNDP	**USD 1,163,242**
PARALLEL CO-FINANCING	
Government of Djibouti - Ministry of Urban Planning, Environment and Tourism (MUET)	USD 1,000,000
Government of Djibouti - Ministry of Finance (through European Development Fund)	USD 5,500,000
(2) Total co-financing	**USD 6,500,000**
(3) Grand-Total Project Financing (1) +(2)	**USD 7,663,242**

SIGNATURES

Signature on behalf of the Government of Djibouti	**Signature on behalf of UNDP**
S.E.M Mohamed Abdoulkader Moussa Helem Minister of Urban Planning, Environment and Tourism	**MRS. Fatima Elsheikh** UNDP Resident Representative
Date/Month/Year: 29 AUG 2019	**Date/Month/Year:** 29 AUG 2019

Table of Contents

List of Abbreviations

ADDS	Djibouti Social Development Agency (Agence Djiboutienne de Développement Sociale)
ADME	Agency for Energy Management (Agence Djiboutienne de Maîtrise de l'Energie)
AfDB	African Development Bank
CERD	Centre des Etudes et de Recherche de Djibouti
CO_2	Carbon dioxide
EdD	Electricité de Djibouti (National Electricity Company)
EDF	European Development Fund
EIA	Environmental Impact Assessment
EU	European Union
GEF	Global Environment Facility
GHG	Greenhouse Gas
IPP	Independent Power Producer
kW	Kilowatt
kWh	Kilowatt-hour
M&E	Monitoring and Evaluation
Mtoe	Million tons of oil equivalent
MW	Megawatt
MWh	Megawatt-hour
NGO	Non-Governmental Organization
OGS	Off-grid Solar services or products
QPR	Quarterly Progress Report
PAYGO	Pays as you go
PIF	Project Identification Form
PIR	Project Implementation Review
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPG	Project Preparation Grant
PnP SHS	Plug-and-play solar home systems (PnP SHS
PV	Photovoltaics
RTA	Regional Technical Adviser
SE4ALL	Sustainable Energy for All
SHS	Solar Home Systems
toe	Tons of oil equivalent
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

Contextualization /definition of few emerging concepts of the off-grid sector.

Off-grid solar devices (OGS)	Pico solar devices, plug-and-play solar home systems (PnP SHS), and component-based systems.
 Pico	Lanterns and simple multi-light systems (which may enable mobile charging) of 0-10.999 Wp. These enable partial or full Tier 1 electricity access to a person or household.
 Plug-and-play	All-in-one packaged SHS kits of 11+ Wp, typically powering several lights as well as energy-efficient appliances, and enabling full Tier 1 or higher electricity access for a household.

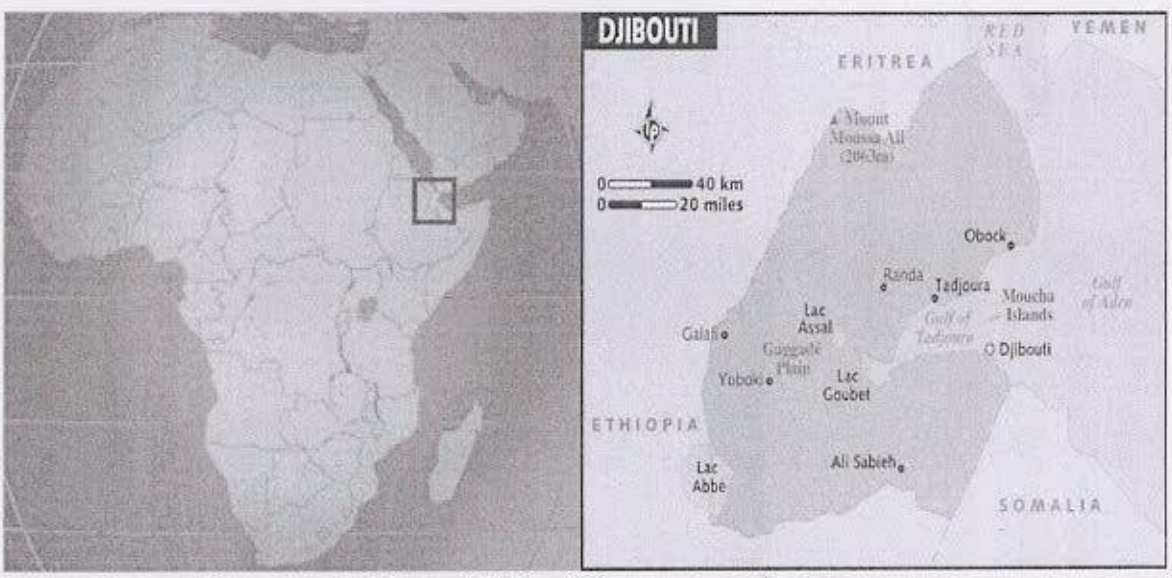
SHS  Component-based systems	Devices in which components (i.e. PV module, battery, lights, inverter, wiring, etc.) are compiled independently. These devices are typically SHS (11+ Wp), but can be smaller.
 Pay-as-you-go (PAYGO)	PAYGO refers to a business model that allows users to pay for their product via embedded consumer financing. A PAYGO company will typically offer a solar product (predominantly solar home systems and multi-light pico devices) for which a customer makes a down payment, followed by regular payments for a term ranging from six months to eight years. Payments are usually made via mobile money, though there are alternative methods that include scratch cards, mobile airtime and cash. PAYGO is typically used on large pico devices (multi-light plus mobile charger <10.999Wp, as well as PnP SHS (>11Wp).
Access to electricity	Traditionally, access to electricity has been measured on the basis of household connections to the national electric grid of their respective country. A recent shift, driven by SE4ALL's Multi-Tier Framework (MTF) for electricity access, seeks to understand electricity access not in binary on or off terms, but as a continuum of service levels that may be satisfied by a range of technologies.2 Using global baseline surveys that are currently underway, the MTF captures more robust granularity of electricity access including capacity, duration of supply, reliability, quality, affordability, legality and safety
Off-grid population	Households (or people) that lack access to an electricity connection to the national grid. These households lack Tier 1 access to electricity according to the MTF, barring the minority that have access to alternative sources of electricity such as off-grid or mini-grid technologies.
Unreliable-grid population	Households (or people) that have a poor-quality or inconsistent connection to the national electric grid. For the purpose of this report, "unreliable grid" households are assumed to receive electricity for less than 12 hours a day.
Potential market	It should be noted that there is no universally accepted definition of unreliable-grid areas. Nor is there reliable data on the size of the population that lives in these areas globally. The overall market of households (or people) that either lack access to an electricity connection (off-grid) or have a poor-quality electricity connection (unreliable-grid), forming the total potential customer base for OGS devices. This estimate includes customers that currently use OGS devices, as they continue to be a market for additional sales, replacements, and upgrades.
Addressable market	The share of the potential market that can be addressed by current OGS business models. It relates to the affordability of the devices by the potential market to arrive at an estimate for the addressable market and provides directional estimates of the market's reachability.

1. DEVELOPMENT CHALLENGE

OverviEW

Geography and Population

Djibouti is a small country located in the Horn of Africa at the crossroad of the maritime roads between Asia, Africa and Europe. It is bordered by Eritrea in the north, Ethiopia in the west and south, and Somalia in the southeast. It covers a total of 23,200 km2, of which 20 km2 are constituted by water bodies. Djibouti has eight mountain ranges with peaks of over 1,000 m.



Maps of Djibouti; Sources: google maps

The total population of the country is estimated at around 900,000 inhabitants (World Bank, 2016). About two thirds of the population lives in the capital city Djibouti. Therefore, the rural population represents less than 30% of the population. Djibouti's major settlements include the capital city of Djibouti, Djibouti City, the port towns of Tadjourah and Obock, and the southern cities of Ali Sabieh and Dikhil According to the 2018 UNDP Human Development Report (HDR), Djibouti is ranked 172th in the Human Development Index, out of 188 assessed countries. Djibouti is classified as a Least Developed Country (LDC). The World Bank (country report 2018) report that more than 23% of the population lives in extreme poverty.

Rainfall is sparse, and most of the territory has a semi-arid or arid environment with less than 1,000 km2 of arable land (0.04% of 23,200 km2). Djibouti has a chronic food deficit and it is dependent on imports to meet its food needs. As such, it is sensitive to external shocks such as spikes in food and fuel prices and natural disasters such as floods and droughts.

Brief overview of the economy

The economy of the country is characterized by an extreme dualism. The modern, commercial, export-oriented urban sector contrasts with the rural sector, which is a subsistence economy based on pastoralism, with very limited access to social infrastructure, services and markets.

The national economy is dependent on foreign financing, foreign direct investments, rents from foreign countries' military bases, and port services, which capitalize on both the country's strategic position at the southern entrance to the Red Sea and on being Ethiopia's main import-export route. Because of its global location – geographic and geopolitical – transportation and logistics services drive the economy.

Overall Information (2016)

Land Area	23,180 km2
Water Area	20 km2
Total Area	23,200km2
Population	846,687
Population Density	36.53/km2
Government Type	Semi-presidential Republic
GDP (PPP)	$3.35 Billion
GDP Per Capita	$3,400

www.worldatlas.com/webimage/countrys/africa/dj.htm

Djibouti has enjoyed rapid and sustained economic growth over the past fifteen years with per capita GDP increasing by 3.1 percent on average per annum in 2001-2017[1]. Economic growth accelerated to more than 6.5 percent on average per year in 2014-2016 as the country engaged in mega-investments in port infrastructure development and railway construction to link Djibouti to Ethiopia. Those strategic investments are expected to boost export of services over the coming decade with GDP growth remaining around 7 percent. Inflation rates have declined from a peak of 11.9 percent in 2008 to 0.6 percent in 2017[2]. Extreme poverty declined in the last fifteen years but remains high since about one fifth of the population continues to live below the international poverty line. Fiscal deficits rose significantly in 2014-2016 to more than 15 percent of GDP on average per year as the country was implementing an ambitious public investment program but declined to around 3 percent of GDP in 2017. As a result, public and publicly guaranteed debt more than doubled to reach 87 percent of GDP in 2017. Foreign exchange reserves are projected to remain strong in 2018 at US$435 million, enough for coverage of about 3.6 months of imports.

Current status of the energy sector

Overview

The national final energy consumption of Djibouti is characterized by the predominance of traditional use of biomass, accounting for about 67% [3]although the country is very dry, with the remaining share from oil products. Biomass use has progressively decreased in urban areas due to a strong penetration of LPG but remain the main fuel for cooking in rural areas. Renewable energies account for negligible amounts of energy consumed across the whole country. The IRENA "Renewables Readiness Assessment 2015" reports a per capita energy consumption of only about 440 kg of oil equivalent in 2012. However, the country has since embarked on several mega-infrastructure projects in various sectors, driving local demand for energy to increase. This has been reflected in rising imports of hydrocarbons and derivatives

[1] World Bank country report 2018
[2] www.worldatlas.com/webimage/countrys/africa/dj.htm

[3] IRENA "Renewables Readiness Assessment 2015

in recent years, which increased more than two-fold in four years from 187,709 tons of oil equivalent in 2010 to 474,487 tons by 2014, according to Djibouti's Statistics and Demographic Studies Directorate.

Although the country sits next to some of the world's largest energy producers, with no proven oil reserves and no refining capacity as of early 2016, Djibouti relies entirely on imported fossil fuels and electricity to meet its energy needs and, therefore, remains exposed to fluctuating oil prices. Given the country's primarily urban profile – in 2014, 77.3% of Djibouti's population lived in urban settings[4], with the majority in the capital, Djibouti City – energy consumption favors modern fuels, in particular electricity, kerosene and liquid petroleum gas. The overall electrification rate in Djibouti is 47% with big disparity between the capital city (51%) and the rural areas (only 10% in average).

Table 1: access to electricity rate

	Ali Sabieh	Arta	Dikhil	Djibouti	Obock	Tadjoura	Total
Households numbers	5,004	2,509	4,295	49,334	1,486	2,276	64,904
Number of Subscribers	2,242	747	1,421	25,175	574	878	31,037
Access Rate	45%	30%	33%	51%	39%	39%	48%

Sources: EdD, 2013

At present, per capita annual electricity consumption is about 330 kilowatt-hours (kWh) against an African average of over 575 kWh and a global average of over 2,770 kWh. This makes the average Djiboutian citizens among the lowest consumers of electricity in the world. Moreover, about 53% of the population does not have access to electricity (90% in rural areas), and the level of unmet demand in the country's power sector is significant. Lack of reliable and affordable energy is identified as a major obstacle economic development.

Besides, the interconnection with or the imported electricity from Ethiopia will likely continue to serve urban populations. The rural population live in no grid area. The power utility EdD (*Electricité de Djibouti* - Djibouti Electricity Company) serves only in urban cities and does not operate in isolated areas. There is an estimated of 20% of transmission losses within the main grid of the power utility.

In urban areas where EdD operates, approximately 37% of electricity is consumed by big industry and activity related to the sea port, airport, free zone and military camps. Residential consumers, including a social consumer category, account for 38%. The remaining 25% is consumed by large retailers, public offices and government offices (World Bank, 2009).

Electricity tariff

Electricity tariffs remain in the hands of the government and are set by ministerial decree from the Ministry of Economy and Finance. They are subject to review by Ministry of Energy. Tariffs are set according to number of factors, such as electricity production cost (including operation cost), social cost and other political economy criteria. Electricity tariffs in Djibouti are high and average USD 0.32/kWh, mainly as a result of increased oil prices and technical and non-technical inefficiencies. The EdD tariffs range from a social price of USD 0.153/kWh (lifeline tariff) to USD 0.426/kWh paid by industry and construction sites. Retailers and government buildings are charged USD 0.397/kWh for their electricity. The cost of electricity in Djibouti is very high compared to USD 0.05/kWh in Ethiopia and USD 0.10/kWh in Kenya, mainly because Djibouti's primary electricity production sources depend on petroleum products. The power utility EdD seems to receive no subsidy from the Government.

[4] https://oxfordbusinessgroup.com/overview/fuel-growth-diversifying-energy-mix-and-securing-adequate-supply-eye-expansion-central-development

IRENA reports that due to a legacy of under maintenance, the effective generating capacity is limited to 57 MW out of the total 126 MW. The cost of imported electricity from Ethiopia at USD 0.07/kWh compares favorably with the USD 0.30/kWh from local diesel plants. It is estimated that Djibouti decreased its domestic power production by over 37% in 2010-2011 once the Ethiopian interconnection was commissioned.5

The power interconnection between Ethiopia and Djibouti, in operation since 2012, provides a cost-effective supply of hydroelectric energy through a 150-MW interconnection line enabling EdD to limit its costly production and reduce pollutions. EdD thermal plants combine a total generating capacity of 126 MW; including Boulaos (108.2 MW), Marabout (14.4 MW), Tadjoura (2.2 MW) and Obock (1.2 MW)6 but the operational capacity is very low due to lack of maintenance and investment. According to the Central Bank of Djibouti, EDD's electricity production reached 446,171 MWh by end-2014, an increase from 372,658 MWh in 2010.

The EdD distribution grid is limited to pockets where population is concentrated (Djibouti City, Tadjoura, Obock, Dikhill, Arta and Ali Sabieh. The two generation plants in Djibouti City, Boulaos and Marabout, feed the main 5-km, 63-KV backbone, while the isolated systems of Tadjoura and Obock are based on lower voltage distribution networks. The existing generation plants are powered by fuel oil and diesel to produce baseload electricity.

Energy security

Djibouti continues to face serious power shortage that the import from Ethiopia is not able to meet under the current agreement between the two counties. Beside the supply from Ethiopia is not provided under a guaranteed capacity agreement, meaning that power may not necessarily be available when Djibouti needs it most; therefore, the country faces some vulnerability in a region that is unstable. The World Bank reports that Ethiopia can and does curtail supply, particularly during its dry season, which results in daily service disruptions. And during the rainy season, failures of the Ethiopian interconnections network can lead to unplanned interruptions. The Djibouti's Government is seeking to increase local generation capacity to minimize its exposure to potential future price increases or disruptions of power from Ethiopia.

Status of rural electrification

Djibouti has a small rural population as more than 70% of the population lives in urban areas. Recurrent droughts, lack of basic infrastructures (water, electricity, health center) and income generating opportunities drive the population towards the urban centers. The remaining one third in the rural areas are mainly nomadic and pastoral people. Despite a few solar electrification pilot programs (Ali Addeh and As-eyla) which are operated by the Agence Djiboutienne de Développement Social -ADDS, the rural areas remain largely unelectrified. Only 10% of the rural population are served against 57% in urban centers. This disparity can be explained by (i) the low density of the national electricity network that covers no more than 30% of the territory while power generation is decentralized in few cities, (ii) the small size of the villages, (iii) the lack of income generating activities of rural settlers to pay electricity bill.

The lack of electricity translates into lack of access to pumped water, unsafe conditions in public spaces for women, a handicap for the school children to do their homework in the evening, and creates a serious constraint on the economic development of small businesses.

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[5] Source: The general description of the energy context in Djibouti is mainly sourced from the IRENA Renewables Readiness Assessment (2015)
[6] Djibouti market brief by the Africa-EU Energy Partnership in 2013

The World Bank Group (2012-13 PPIAF) conducted a technical, economic, and financial feasibility analysis for electrification through solar energy of 25 rural villages in Djibouti with the view of addressing energy access and better manage water scarcity, safety and well-being of vulnerable populations in rural areas of Djibouti. This study produced a technical, economic, and financial feasibility analysis to assess the most viable and sustainable roll-out option available to electrify each of Djibouti's 25 rural villages targeted including (i) a pre-feasibility analysis, (ii) public-private partnership (PPP) option and PPP operations and maintenance contract structuring recommendations, (iii) recommendation for legal/regulatory changes including the identification of appropriate contractual and governance arrangements to incentive the private sector operator to maintain the mini-grid, ensure a reliable supply and to extend the mini-grid, (iv) plans/strategies including a census update and pilot prioritization plans and (iv) workshops/seminars/public meetings including pilot project appraisal and trainings. The initial number of targeted villages were 25, but further reduced to 19 due to technical criteria: distance of the village to the national grid, presence of public administration, presence of income generated activities, number of households, scattering or houses, etc.

Private sector

In 2015, the Government of Djibouti launched an ambitious renewable energy and energy efficiency program focused on the development of the important solar, wind and geothermal resources of the country. Within the so called "Vision 2035" policy, a transition to 100% renewable energy is aimed within a decade. In that line, the Government passed a law to break the absolute monopoly of the state-owned Electricity of Djibouti (EdD) by enabling private sector to enter the market of electricity production in Djibouti. However, the transmission and distribution of electricity remains under the monopoly of the EdD.

Private sector participation in the production of electricity is perceived as an important source of finance for the needed investment in the sector. It is also seen as a driver for new technologies, innovations, improved management techniques and organization, etc. However, since the notion of IPP was introduced to stimulate private sector involvement no direct investment has been recorded because the price offered by EdD, aligned to the 0,07$[7] of the Ethiopian hydroelectricity grid, is far too low to justify the risks. Therefore, further reforms and measures are required to increase the bankability of the renewable energy projects proposed by local and international investors. Actions for de-risking the renewable energy sector will have to take into account (i) the smallness of the market that does not really allow economy of scale (large solar plant) to reduce generation cost, (ii) the insufficient electricity transport and distribution infrastructures, (iii) the overall investment climate of the country with regards to renewable energy (need for fiscal incentives and special financial products for off-grid and mini grid solar).

Renewable Energy potential

Djibouti has significant renewable energy resources, relative to the size of its population and scale of its economy. Djibouti's abundant geothermal, wind and solar energy resources can be developed to bring higher quality energy services to populations across the country. Renewable energy can meet the twin goals of improving energy access and energy security in Djibouti. The development of local renewable resources can reduce the country's dependence on imported and expensive fossil fuels.

As the country's demand for electric power increases to meet the ambitious economic development programme outlined in Vision 2035, Djibouti would need to look into affordable and reliable options. Renewable energy could help meet Djibouti's employment creation challenge. It is now widely

[7] sources: ministry in charge of energy

recognized that the renewable energy sector employs more people on a megawatt-hour (MWh) basis than the conventional energy sector. Djibouti is well placed to capitalize on this opportunity and reduce its high rate of unemployment, estimated at 60%.

Renewable energy costs have fallen significantly and are likely to continue on a downward trend. An increased demand globally for fossil resources is likely to push energy prices up, while increased deployment of renewable technologies pushes energy prices down in line with progress in technology and economies of scale8. This offers an opportunity for Djibouti to rethink its energy strategy, develop policies and build institutions that would make Vision 2035 into a reality.

Renewable energy can be particularly suitable for the off-grid market as well the grid market. Power produced through renewable-based systems can be stand alone or be fed into the grid, providing clean and a more secure power supply. The country has a highly urban population and can achieve universal electrification with relative ease compared to countries in the region. However, the government needs to create the regulatory frameworks and modalities for concessions (mini grid) and Power Purchase Agreements (PPAs) for grid connected power that would enable healthy cooperation between public and private entities to develop Djibouti's power sector.

Geothermal:

The Republic of Djibouti is located within the Afar Depression. This is a geological triple junction structure formed by the intersection of the Red Sea, the Gulf of Aden and the East African rifts. A number of countries along this tectonically active region are exploring geothermal energy as an option to meet their energy requirements. Kenya has already an installed capacity of 500 MW from geothermal, and Ethiopia has 70MW. One important advantage of developing geothermal energy is to have it as a baseload. Most renewables are variable in nature and thus need to be paired with other technologies that can provide the baseload. Geothermal, however, provides secure baseload power, and is hence better suited to replacing the existing heavy fuel oil baseload power.

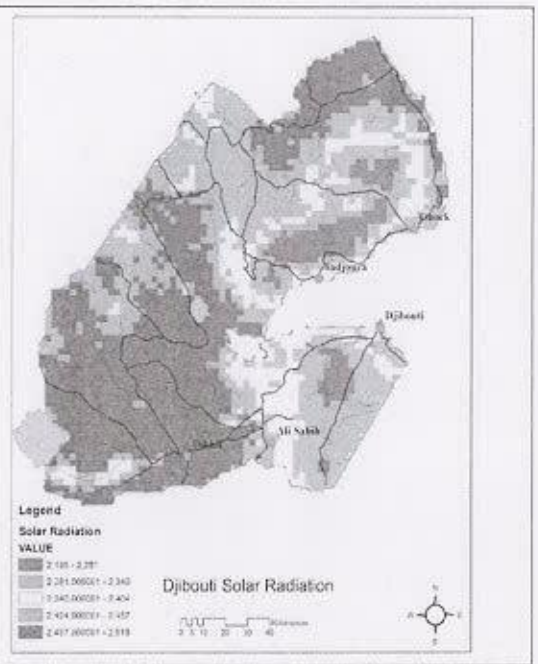
In Djibouti, various exploration activities since the 1970s have demonstrated the existence of significant geothermal resources in the Assal Rift Zone. The Assal rift, which includes the exploratory drilling focus of the Geothermal Power Generation Project Djibouti has experienced stop/start geothermal exploration. Nevertheless, the work completed so far has built up enough of a picture to attract significant policy attention and exploratory activity. The overall potential of geothermal in Djibouti is estimated between 1,000 and 5,000 MW. There is an ongoing (under implementation) GEF-WB project on geothermal development.

[8] IRENA, Djibouti RE readiness

Solar:

Solar energy is very abundant in the country. The irradiation ranges from 4.5 kWh/m^2/day to 7.3 kWh/m^2/day, with a yearly average of 5.7 kWh/m^2/day.
So far, the solar resource has been used in a limited manner for electricity generation with photovoltaic (PV) systems in rural households, schools, offices, hospitals and health centers; for solar water pumping; and for solar telecommunication systems. There are some small Solar PV based power plants coupled with micro-grids in two villages in As-Eyla and Ali-Addeh. The village of As-Eyla is one of the biggest in the country and the village of Ali-Addeh shelter more than 20,000 refugees from the neighboring Somalia. But these were primarily donor-driven initiatives and lacked sustainability.

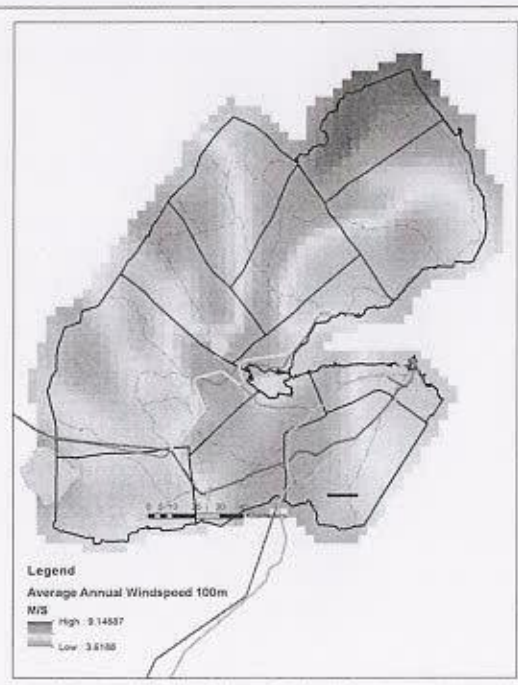
The Ministry of Energy is planning to build a 50 MW on grid solar PV plant in Grand Bara. But there is no power purchase agreement (PPA) that enables the independent power producer (IPP) to move on with the plant construction.



Wind:

Since 2000, the Government of Djibouti has explored the potential wind energy resource in a variety of studies. Some sites in the country have stable and very high wind speeds, such as Goubet, Grand Bara, Yoboki, and Ali-Sabieh mountain areas. Average wind speeds of 9 to 10 m/s are recorded at the coastal areas around the Gulf of Goubet. The inland shows lower wind speeds during most months, averaging at 6 m/s.

However, no wind farm project, no matter how small, has yet been achieved in Djibouti, despite multiple studies demonstrating the profitability of this technology. The Goubet site in particular has received considerable attention, and the European Commission is considering a 20 MW wind farm there. There is as well some interest from private sectors (IPPs) especially for agri-business industries, proposing to build a 30 MW wind farm. So far, the main bottleneck remains the lack of proper PPA, as it is up to the power utility EdD to set the price, and there is no third party yet that can play the regulator role



Stakeholder Analysis and Institutional Framework

Who is who in the energy sector?

The mains institutions that are relevant to the project are listed below with a short presentation. Their roles and responsibilities are provided in Annex F. The section 3.2 provides an idea of the "institutional structure" for deploying the underlined project.

The Ministry Habitat, Urban and of Environment (MHUEAT)

Ministry of Housing, Urban Planning and Environment of Djibouti (MHUEAT) is the political and operational focal point of GEF. The Ministry is in charge of the environmental policy of Djibouti, a country characterized by high vulnerability to climate change with very little arable soil; 89 per cent of the country is desert, 10 per cent is pasture, and 1 per cent is forested (USDS, 2010). As a result of little precipitation and lands unsuitable for agriculture, Djibouti imports nearly all of its food (CIA, 2010). Djibouti is a resource scarce country, this proneness to natural disasters is exacerbated by scarce water resources management, poor land use planning, lack of building code enforcement, and limited capacity to react to natural disasters (GFDRR, 2009). Therefore, the Ministry plays an important role to develop policies, strategies and programs to face to a number of natural hazards, including multi-annual droughts, frequent flash floods, frequent earthquakes, volcanism and fires fueled by droughts (GFDRR, 2009). The Ministry oversees equally the issues of costal area management. The ministry is in charge of adaptation strategies and adaptation measures, which must form part of a comprehensive social and economic approach, should include the limitation of deforestation and the development of renewable energy.

Ministry of Energy and Natural Resources (MERN)

Ministry of Energy and Natural Resources (MERN), under the Office of the President, is responsible for designing, defining and developing government policy on energy and natural resources. It defines rules, regulations, statutory instruments and legislation for the energy sector including electricity, petroleum products and renewable energy.
The ministry oversees the overall development of the energy sector of the country including subsector such as electricity, fuels, renewable energy, rural electrification, energy efficiency, etc. The ministry implements / supervises the following:

- The formulation of policies, strategical plans, regulations of the country
- Development of energy resources and the required infrastructure;
- Follow-up and supervision of electricity generation, transmission and distribution;
- Strengthening of the electrical network for national energy supply;
- Development of conventional and renewable energy sources; and

MERN oversees four important government bodies, EdD (the power utility), International Hydrocarbon Company (Société Internationale des Hydrocarbures), ADME (Agence Djiboutienne pour la Maîtrise de l'Energie) entrusted with the implementation of energy efficiency strategies.

Ministry of Economy and Finance

Ministry of Economy and Finance (Ministére de l'Economie et des Finances, Chargé de l'Industrie et de la Planification) is in charge of industry and planning and sets the electricity tariff. The Directorate of External Finance is responsible for implementing and monitoring new projects. The ministry is also involved in regulating and stabilizing oil prices under a liberalized regime.

Electricité de Djibouti (EdD)

EdD is the national power utility of Djibouti. It was incorporated in 1960 as a government owned industrial and commercial company under the Ministry in charge of energy. EDD has the mandate for the provision electricity throughout the country. EdD operates 4 thermal power production plants but the bulk of its power is imported from the Ethiopians hydroelectric grid:

- Boulaos and Centrale de Marabout 2 in Djibouti ville for a total installed capacity of 113 MW
- Ali-Sabieh, Dhikil, Tadjourah, Obock and DAY for a for a total installed capacity of 9.9 MW
- An interconnexion with Ethiopia since May 2011.

About 96% of the power is consumed in Djibouti City and only 4% in the secondary cities. The length of the transmission line is 1457.6 km including 418.6Km of HT, 399 Km of MT and 640 Km of BT. EdD has 1014 em0ployer, 54985 normal customers and 939 special customers. To modernize the sector, a trial installation of 3,500 meters was used to test the feasibility of the system, which will be rolled out to 41,000 metering points when fully implemented, serving a population of over 600,000.

Since March 2015, EdD no longer have the full monopoly for power production as a new law adopted in 2015 (loi n°88/AN/15/7ème L) enabled the participation of IPP under a PPA contract with EdD. With the view of diversifying its sources of power, EdD has signed with the Africa finance Corporation a MoU for the development of the 60 MW wind park of Goubet. This project is however not yet implemented. There is no operating RE based IPP in the country as per December 2018.

Social Development Agency of Djibouti (ADDS)

Djibouti Social Development Agency (Agence Djiboutienne de Developpement Sociale) (ADDS) was created in 2007. Under the Secretary of State for National Solidarity, ADDS is a financially autonomous public legal entity that implements the National Development Initiative for poverty reduction. ADDS is responsible for the implementation of rural electrification objectives in areas not covered by the EdD grid. The energy component of ADDS work is managed by the Directorate for Rural Electrification.
The Social Development Agency 's mission is to contribute to the fight against poverty and vulnerability by supporting sustainable development projects in a participatory, partnership approach and proximity.
Indeed, ADDS mission is to mobilize and implement funding and support such actions contribute to:

- To improve the living conditions of disadvantaged groups (men, women and children), including the achievement of collective infrastructure;
- When creating sustainable employment and income generation for vulnerable populations with economic difficulties in entering the labor market (especially women);
- Strengthening relay structures (associations, consultants (s), development workers, public and private organizations working to achieve the objectives assigned by the Agency) by providing support in training and / or equipment, capable of improve their technical and organizational response capabilities.

ADDS focuses its intervention strategy prioritizing five approaches are preferred:

- Land for an integrated and coherent response to a defined space;
- Participatory and empowering;
- Proximity to stick better to the socio-cultural realities on the ground;
- Emphasizing partnership contracts, the principle of "Make do" and accountability partners;
- Consideration of Gender and environmental approaches.

Société Internationale des Hydrocarbures

International Hydrocarbon Company (Société Internationale des Hydrocarbures), under MERN supervision, is responsible for hydrocarbon imports, processing and operations. Imports are dominated by three international oil companies - Shell, Total and Oil Libya.

Agence Djiboutienne de Maîtrise de l'Energie

Djiboutian Agency for Energy Management (Agence Djiboutienne de Maîtrise de l'Energie) (ADME) is a public institution whose mission is to promote energy efficiency and renewable energy in all economic sectors. ADME is responsible for several activities. It communicates knowledge relating to policy development on the rational use of energy. It proposes solutions for reducing the energy bills of state institutions and homes, recommending best practice. It assists industry in energy demand management and integrates energy efficiency into industrial management systems. It encourages scientific research and assistance to reduce energy losses. Finally, it develops and ensures compliance with thermal standards for new buildings and old building renovation.

Office Djiboutien de Développement de l'Energie Géothermique - ODDEG

The Geothermal Energy Development Office (Office Djiboutien de Développement de l'Energie Géothermique - ODDEG) established by law 32/AN/13/7ème L January 20, 2014 under the President's office with the aim identifying the various types of geothermal resources of the country, carrying out the exploration work, recognition and study.

Commission Nationale de l'Energie - CNE

The National Energy Commission (Commission Nationale de l'Energie - CNE) was established by a Presidential Decree 11 2009-0218/MERN October 2009. Its job is to help the government plan, implement and monitor the Djibouti National Energy Master Plan, and to update the energy map of the country.

Centre des Etudes et la Recherche de Djibouti

Centre for Studies and Scientific Research of Djibouti (Centre des Etudes et la Recherche de Djibouti) (CERD) is a public scientific institution. It is directly attached to ministry de Higher Education and Research. It provides an institutional framework for researchers, scientists and academics from all specialisms. It conducts studies to evaluate renewable energy potential in Djibouti and carries out pilot research that can feed into the energy knowledge system. The CERD solar laboratory, working under the authority of the Institute of Earth Sciences, has installed a grid-connected 300 kW PV plant, which it monitors and uses for scientific testing.

Université de Djibouti

The University of Djibouti (Université de Djibouti) is responsible for offering training programmes in courses related to energy. It has established an engineering department and is expected to expand its limited training and research capabilities.

Chambre de Commerce de Djibouti

A few small private sector suppliers of renewable systems and installers are operating in Djibouti. The Djibouti Chamber of Commerce (Chambre de Commerce de Djibouti) was established in 1970 by a group

of local businesses. It has since evolved to become the principal representative institution of the private sector at the national level. Its main tasks are to represent the viewpoints of economic players, present their opinions and proposals supporting economic prosperity and poverty reduction, and promote development in the Republic of Djibouti.

The Djibouti Chamber of Commerce also facilitates trade engagements and helps raise awareness of issues that help strengthen domestic markets among relevant private sector players. It also carries out relevant studies and data collection. It has three departments: consulting, technical assistance and training. All economic sectors are represented in the decision-making body through the General Assembly of 44 elected members and eight executive members who support the president of the Chamber of Commerce. Energy features strongly in the organization's strategic focus.

Agence Nationale de Promotion des Investissements - ANPI

The National Investment Promotion Agency was established in 2001. Its goal is to encourage investment promotion in Djibouti through a policy of flexibility in investment operations and development of an enabling regulatory framework and regulatory procedures.
As part of its investment promotion and knowledge development role, the ANPI is responsible for promoting investment opportunities and the incentive environment of the Republic of Djibouti. Within its investment remit, renewable energy is seen as an important area to boost economic development and create high quality employment for the economy.

NATIONAL STRATEGIES AND PLANS

Vision 2035

In 2014, the Government of Djibouti launched an ambitious long-term development plan, known as Vision 2035. The planning strategy aims to place the country on a sustainable development pathway by strengthening the country's human capital, developing its private sector and reforming its systems of governance. The ambitious plan covers social and economic aspects with a focus on education, tourism, fisheries, new information and communication technologies, transport and logistics, industry, and energy.

The Vision 2035 identify energy access and energy security as strategic key for expanding manufacturing and industrial activities. The plan sets forth the ambitious goal of meeting 100% of Djibouti's energy demand through renewable energy by 2020 to be sourced mainly from geothermal, wind and solar, as well as more importation from the Ethiopian hydro electricity grid.

The realization of these goals requires significant capital investment and support from private sector partners, but considering the increase in renewable energy generation throughout the East African region, Djibouti is well positioned to tap into global capital flows.

However, the 100% renewable energy by 2020 target will not be met. Significant effort is required for addressing the challenges.

Energy Policy (2015):

The Government of the Djibouti recognizes that lack of energy access in rural areas is a major barrier to the country's economic development, social stability and environmental sustainability. To address the problem, the Government had emphasis rural electrification as one of the pillars of its Energy Policy

(2015). It is stated in the Energy Policy that "Energy has been identified in the national strategy as a tool to combat poverty. Rural electrification is the most effective way to combat poverty, social exclusion, and gender inequalities. The availability of electricity in the rural areas drives a new dynamic for socio-economic development, offers new employment opportunities, creates income-generating activities, and improves the quality of basic social services (water, health, education, etc.). The development of the income generating activities has the indirect effect of reducing rural exodus and thereby reducing poverty. The Policy concludes by stating that rural electrification must rely on the renewable energies available in these localities. In addition, it is necessary to favor the cheapest energy resources in order to ease investment costs of potential projects and consequently the energy bills of the villager consumers.

Second National Communication to the UNFCCC (2013):

The SNC highlights that the main sources of GHG emissions are agriculture and energy sectors. The report identifies the main mitigation measure being the increase of RE and the reduction of fossil fuel-based energies. This is in accordance with this proposed project.

The Nationally Determined Contribution (2015)

The Intended Nationally Determined Contribution of Djibouti indicates a reduction target of 40% less GHG emissions by 2030. This will be achieved through various initiatives including: (i) an additional 50 MW from Ethiopia, (ii) installation of a 60 MW wind farm power plant, (iii) several solar PV plants reaching 250 MW, and (iv) geothermal exploitation.

BASELINE SITUATION AND PROBLEM TO BE ADDRESSED

Current situation of the electricity sector of Djibouti

The challenge of electricity planning in the context of Djibouti

Djibouti has a very narrow electricity market. Power generation is therefore expensive due to small size of the demand. In this context, electricity planning on a cost-effective manner is challenging as there are no outlet for production excess nor facilities for storage if not in small quantities through costly batteries. As a result, electricity production must at every moment be strictly equal to consumption to avoid waste. The power peak in Djibouti, estimated at of 65,500 kW, must be consumed at the same time it is produced to keep cost under control. From December to March, the power generation cost can increase dramatically when the demand drops to less than 40,000 kW (less air conditioner).

High production cost from the small thermal plants

EdD has been continuously investing in new small generating facilities to meet the growing demand. In 2000, the demand was 39,400 kW. It grew to 65,500 kW by 2010 (meaning 1.7 times higher) and EDD had to acquire more than 60,000kW at a cost of least 1,000 euros per KW. Energy production during the same period increased from 226,344 000 kWh to more than 340,200 000 kWh or 1.5 times more. Because the production is based on diesel engine with a limited lifespan of 15 years, the plants need to fully renewed regularly. For Djibouti City, there are two plants in service: Boulaos which produces 90% of the energy with 100MVA of installed capacity and Marabout II which produces 10%.

Exclusive use of diesel generators

In Djibouti, one need a quarter of a liter of diesel or petrol to produce a single kWh of electricity. With the raising and unstable oil price the production cost become unpredictably high by adding the costs of

maintenance, operation, distribution and of course the depreciation of the machines. In order to reduce the cost of production, EdD uses heavy fuel oil at Boulaos, which is about 50% cheaper than diesel. It is a refinery by-product that is very viscous and must be heated to 110 degrees when injecting into the engine. In addition, EdD buys directly from the Fujairah refinery and has a tanker coming in every month. In the summer, Boulaos must be supplied daily by about 10 to 15 30-ton tank trucks causing severe environmental issues. EdD reports that an average of 40% of its turnover is spent on the purchase of petroleum products. During the soaring price of the barrel of oil that had risen to $145 per barrel, EdD has to devote all its resources to the purchase of fuel for the production of electricity.

EDD is looking for alternative means for production, especially renewable energies such as:

- Geothermal energy,
- Wind turbine, currently being planned at the Goubet site.
- Solar (grid as off-grid)
- the tidal energy accessible in the pass of the Goubet,

Electricity distribution and consumption

EdD manages approximately 38,000 connections for the metropolitan area Djibouti City. The network is based on a 5 km, 63 kilovolt (kV) cable connecting the Boulaos and Marabout stations, and a 225-kV amp interconnection line from Ethiopia which covers about 65% of the national domestic needs during the summer months. The distribution system within the city is at 20 kV. Electricity is supplied to the customers through around 300 distribution substations. The isolated system grids are based on lower voltage distribution networks.

Approximately 37% of electricity is consumed by large industry and activity related to the sea port, airport, free zone and military camps. Residential consumers, including a social consumer category, account for 38%. The remaining 25% is consumed by large retailers, public offices and government offices (World Bank and Parsons Brinckerhoff, 2009).

The service sector and domestic load components dominates peak demand. There are two daily peaks between May and October, largely concentrated during the afternoon office opening hours and in the early hours of the morning when air conditioning systems are in use

Rural electrification – unserved and underserved population

Only a third of the Djibouti population leave in rural area but the electrification rate is these settlements is very low (10%). Grid extension is not a viable option due the scattered rural population and low density. Djibouti is yet to build its electricity infrastructure in a planned and systematic manner. At the moment, much of its rural electrification programs relies on government funds, international donors and the country's utility, which is struggling to maintain service to existing clients. More than 40% of the urban / peri urban population are not connected to the grid. The population connected to eh grid faces high prices and unreliable quality (outages).

This situation provides opportunities for deploying affordable off-grid solutions. Mini -grid and standalone renewable power can meet demand in unserved rural areas in Djibouti and can replace existing diesel systems. As a distributed and scalable resource, renewable energy technologies are well suited to meet the need for power in remote areas. However, it is also important to design flexible mini-grids that can be integrated into the wider grid in due course.

Main barriers to accelerated development of sustainable mini-grids:

Djibouti needs to rapidly build its technical and regulatory capacity for off-grid technologies and delivery models. There is very little technical expertise in the country and the current regulatory environment does not match the magnitude of its energy challenge.

Legal, regulatory and institutional framework:

The production of electricity is liberalized, meaning Independent Power Producers (IPPs) can build and run their own power plants. But they can only sell the produced electricity to the power utility as the distribution and commercialization has not been liberalized and is still a monopoly of EdD. The main issue regarding IPPs is the power purchase agreement. EdD only accepts to pay to IPPs a tariff of USD 0.07/kWh (same as the cost of electricity imported from Ethiopia) and of course, this price is too low to attract private operators.

As per November 2018, the Government of Djibouti adopted a new decree related to the application of the IPP law (loi n°88/AN/15/7ème L) fixing the modalities and procedures for obtaining license and concession rights for power production. It specifies the provisions laid down for auto production and IPP as well as the competences and missions devolved to the Regulatory Service of the Energy Directorate in the regulation and monitoring of the activities of independent power producers.

This decree aims, on the one hand, to complete the legal arsenal governing the activities of independent power producers and, on the other hand, to achieve the objective that the country has set itself to achieve 100% renewable by 2020. It fixes the limit values of power generation installations and the application, annual licensing and license fees for independent power producers. The decree sets the requirements that must be met by power generation facilities, in accordance with the provisions of the law regulating the activities of independent power producers. It defines the license and concession schemes to which the different categories of independent power producers will be subject.

The Government has established also regulations that allow private operators to become involved in rural electrification, thus offering opportunities for the utilization of RE. In rural areas, a private operator can build, run and sell its electricity at the village level. However, the electricity tariffs are unilaterally fixed by the Ministry of Energy which gives the license. The tariff usually turns to be too low for a private sector to operate.

In addition, there is insufficient capacity of relevant stakeholders (Government, institutions, national agencies) to formulate and enforce policy and regulatory frameworks on rural electrification in an integrated manner, especially in combination with other energy usages such as water pumping (agriculture), cooling (fishery) and seawater desalination.

Technology supply chain:

The technology supply chain for RE in Djibouti is at a very nascent stage. There are a few local SMEs capable of assembling simple RE installations based on imported machinery and turbines, but they lack the technical and engineering capacities to ensure optimal system design, installation and maintenance. In the rural areas, there is only very limited local technical expertise available on how to properly administer, operate and maintain off-grid systems. The low quality and quantity of skilled and competent workers in the power sector adds additional risks and increases the cost of mini-grid operation due to the need to rely on expensive imported services even for basic repair and maintenance.

Sustainable O&M&M model:

The lack of experience with, and demonstration of, sustainable operation, maintenance and management (O&M&M) of RE-based mini-grids represents a key bottleneck and the reason for the failure of past donor-funded projects. Technical and managerial capacities are extremely low at the local level, especially in provincial and rural areas.

The key missing aspects of a sustainable O&M&M model that have to be put in place are: (i) technical oversight over plant operations and responsibility for repairing faulty equipment; (ii) an efficient and effective tariff structure which adequately covers both start-up and O&M&M costs; (iii) a robust and effective financial management, billing and payment collection system; (iv) community mobilization, customer relations and conflict resolution procedures (such as in case of illegal connections or theft), engagement of productive end-users, etc.

Access to capital:

Significant upfront investment requirements remain a roadblock for implementation of many projects. RE projects are capital-intensive, with significant investment requirements that are generally beyond the capacity of local companies or communities. In addition, the local banking sector is not sufficiently capitalized to facilitate financing for RE projects with longer pay-back and substantial risks.

Investors' awareness and perception of risks:

Information about the potential and the benefits of off-grid RE (especially solar PV) is not developed in Djibouti. There is little data about prospective sites and their characteristics. Basically, there are no single information point where a potential developer can receive required guidance and data to make an investment decision. Whilst the national energy strategy does acknowledge the importance of RE development in tackling energy deficits in rural areas, the primary focus and efforts of the Government so far have been on addressing the energy deficit in the capital city Djibouti and facilitating construction of a second and even a third interconnection line with Ethiopia. Promotion of solar PV and wind-based mini-grids requires a different approach, more oriented towards private sector and local communities, and requiring open and transparent access to information for investors. The scarcity of successful and sustainable RE projects is limiting opportunities to raise awareness and to build up the confidence of local communities, project developers and investors, and is in itself a big deterrent to market development.

Very little private sector window and interest

The little private sector interest is still in urban areas for on-grid electricity generation projects. But even for those projects, nothing is materialized yet due to the lack of bankable PPA and an independent Regulator. For rural areas, there is still no interest for the private sector to invest in mini-grids because of the very low tariffs unilaterally fixed by the Government. In the WB/IFC Doing Business 2018 data, Djibouti is 96th out of 189 economies on protecting investors and 175th on enforcing contracts.[9]

Information/cultural sensitivities

The population in rural areas are used to free electricity and free water supply services. Even if there is a form of payment, it is too low, at a symbolic value, but not a real cost that can cover the viability of the system. The capacity and willingness to pay in rural areas is a major barrier.

[9] See http://www.doingbusiness.org/data/exploreeconomies/djibouti

Summary of the barriers and mitigations strategies

Table 2: Barriers to off-grid uptake and mitigations measures

Types of barriers	Present Situation	Strategy for addressing the barriers
Policy/Regulatory and Institutional Framework	There is a new decree regulating IPP licensing and activities but more enabling policy and legal/regulatory and institutional framework for promotion off-grid and private sector involvement. Is required to create a viable market	Formulation of an enabling policy including a set of regulations to facilitate private sector investment in renewable energy based mini grid and standalone systems.
Appropriate tariff and regulation for renewable energy	Unrewarding IPP tariff (0.07/kWh) to attract private investors Limited public funding for rural electrification	The tariff offered by the Ethiopian grid cannot be used as baseline for attracting IPP in Djibouti. A study will be undertaken to provide insights on the appropriate tariff setting for various technologies and concepts for the off-grid sector.
Project Development and Bankability	Overall lack of familiarity on project development and structuring for renewable energy and the off-grid sector.	Provision of training program to the private sector, financial and government institutions on the requirements for increasing renewable energy and off-grid projects bankability.
Financial instruments for the off-grid sector	Absence of financial instruments to unlock private sector investments for mini grid and standalone systems.	Financial de-risking instruments (loans, guarantees and result based grants) will be developed to promote investment in renewable energy based mini grid and standalone systems.
Technical Expertise	Lack of skills to design, build, operate and maintain mini grid systems	Local institutions and project developers will be supported with up-to-date and accurate information on renewable energy concepts and technologies. Human resource capacity will be strengthened at the local level to support implementation of project, the maintenance and repairs of systems.
Knowledge management and investment promotion.	Absence of promotional/outreach activities to generate investor interest in renewable energy in Djibouti.	Outreach/promotional activities will be implemented, and project experience/lessons learned will be documented.

The baseline scenario or any associated baseline projects

Both the Government of the Djibouti and the international donor community acknowledge that lack of energy access in rural areas is a major detrimental factor for country's economic development, social

stability and environmental sustainability. Thus, several projects are planned in the area of energy access in rural areas.

Electrification of 19 villages through Solar PV (either mini-grids or individual kits) - World Bank:

The World Bank Group, though its Public-Private Infrastructure Advisory Facility (PPIAF), has facilitated a feasibility study for electrifying 19 villages taking into account technical criteria such as: distance of the village to the national grid, presence of public administration, presence of income generated activities, number of households, scattering or houses, etc. Mini-grids or individual kits are considered depending on the village structure. The responsible partner at national level is the Social Development Agency of Djibouti (ADDS). The 19 villages were divided into 3 groups:

- Mini or micro-grid, for those who need a small solar power plant from 50 to 200 kW;
- Kits, for those who require individual solar kits;
- Batteries, for those who require portable/rechargeable batteries

On the basis of international review of best practices of solar rural electrification market models, the overall assessment is that Djibouti should introduce a combination of a dealer model and non-concession market model. This approach is best described as Result Based Finance (RBF). It implies that for specific geographical areas, this model would provide subsidies on a per Wp basis to a small number of suppliers of one to three firms. Such a combination will provide an incentive for selected firms to keep the pace of technology innovation in the field of SHS/pico-systems while limiting competition in order to attract private sector participation. In the case of pico-solar products below 5 Wp, the project will pay a fixed subsidy per unit sold.

However, there is uncertainty whether this programme will be implemented in the near future. The World Bank funding was limited to conduct the pre-feasibility studies (done since 2014) and no commitment has been made to continue further. The proposed UNDP-supported GEF-funded project will use this project as baseline by taking into account the studies while focusing on the enabling environment of the energy sector (business model to have sustainable financial viability) and build the capacity of the key stakeholders.

German government through the GiZ

GIZ in association with the Chamber of Commerce of Djibouti, has trained small scale entrepreneurs in renewable energy technology, installation and maintenance. The Chamber of Commerce is guiding these entrepreneurs in developing successful O&M enterprises.

Based on this experience, a new EUR 4 million project is under consideration between the Ministry of Foreign Affairs of Djibouti and the Government of Germany to provide mini-grid and solar home systems in areas with a large concentration of refugees. This project should be started in the course of 2019.

Japanese Cooperation

Through its private sector window, the Japanese Cooperation is seeking to support a private Japanese company to develop mini grid and SHS in Djibouti. This will involve a total grant of EUR 10 million. The project should be implemented under the supervision of the Ministry of Energy. A sound O&M model showing local ownership will be a key element for securing final approval of the Japanese Government.

Other initiatives:

International Fund for Agricultural Development (IFAD) has just started the implementation of a large program on sustainable agriculture: Surface Water and Soil Management Programme (PROGRESS), from 2017 to 2021. Overall, the focus is on agriculture, but it is worth mentioning that several water drillings are planned under the project, all of them using solar panels as their energy source. Thus, this can be a good synergy with rural electrification.

There are few other initiatives for min-grids in rural areas. The most important ones, already under implementation, are in Hol-Hol, Ali-Addeh, Adaylou, and As-Eyla. These projects faced several difficulties and are rich in lessons learned, from the legal aspects to the business model challenges, which have helped in the design of the present GEF-financed project.

2. STRATEGY

PROJECT RATIONALE AND POLICY CONFORMITY

The project will reduce GHG emissions by creating a favorable legal, regulatory and market environment for OGS (Off-grid Solar services or products) and by developing the capacity of the local institutions and private sector to promote peri-urban and rural electrification through renewable energy mini-grids and standalone systems. By off-grid solar services, the project means both min-grids (MG) and standalone home systems (SHS). The project is aligned to the Vision 2035 of the government of Djibouti that seeks renewable energy penetration of 100% to address poverty and exclusion.

However, due to budgetary constraints, the Government is seeking for a large participation of the private sector in mobilizing the required investment and technical know-how for providing sustainable electricity to the unserved and underserved population. Indeed, mini grid and standalone systems are expected to play a major role in unlocking the potential of the population through income generating activities.

To reach the aimed objectives, the project will be implemented through two components (i) Policy and financial instruments, Capacity building, and knowledge management and incentive scheme for sustainable off-grid technologies and delivery models (ii) Showcasing Solar-battery mini-grids.

INSTITUTIONAL STRUCTURE

The Ministry of Housing, Urban Planning and Environment of Djibouti (MHUE) is the political and operational focal point of GEF in Djibouti. In this capacity it will be entrusted with implementation of the present project under the UNDP National Implementation Modality (NIM).

MHUE will work closely with the Ministry of Energy and Natural Resources (MERN) that is responsible for formulating and implementing the Government's policy in the field of energy. The MERN is also entrusted with the responsibility of putting in place policy, plans and programs that govern rural electrification through either grid extension or isolated mini-grids. In terms of expertise, the Ministry of Energy will be supported by various agencies and institutions such as Electricité de Djibouti, the Social Development Agency of Djibouti, l'Agence Djiboutienne de Maitrise de l'Energie, la Commission Nationale de l'Energie, Centre des Etudes et la Recherche de Djibouti.

COUNTRY OWNERSHIP: COUNTRY ELIGIBILITY AND COUNTRY DRIVENNESS

Through the "VISION 2035" strategy of the Government of Djibouti, is resolutely engaged to 100% renewable in an attempt to reduce dramatically greenhouse gas emissions and cut the importation of oil-based fuels for the power sector.

For local electricity generation, the country relies on rusting small thermal plants characterized by a high consumption of fuel. Therefore, electricity tariffs in Djibouti are very high (average USD 0.32/kWh) compared to USD 0.05/kWh in Ethiopia and USD 0.10/kWh in Kenya. The high cost is explained by the dependency of imported petroleum products, high technical losses and management deficiencies.

The project is fully in line with national priorities and will contribute to meeting the objectives of the Government to reduce GHG emissions that contribute to global warming and to promote energy development that will cater to the needs of the population at a lesser cost compared to the present diesel option being utilized

This project is consistent with the GEF-6 strategy to address climate change (CCM-1 Technology Transfer, and Supportive Policies and Strategies).

DESIGN PRINCIPLES AND STRATEGIC CONSIDERATIONS

The project seeks to develop a market for mini grid and standalone based renewable energy (solar / wind) in Djibouti through a public private partnership model in which the private sector will be enabled to invest in the rural electrification and sector. The approach is market driven by creating the conditions for a large participation of the private sector. Therefore, the main focus of the project will be developing conductive policies and regulatory framework for investment in mini grid to meet the need of the underserved population in rural and peri urban areas according to their needs. Both mini-grids and standalone systems will be promoted to accommodate every need; weather for household or for productive uses. The project will advance the country agenda for 100 % renewable to reduce electricity cost, unlock the potential for income generation and cut greenhouse emissions.

The capacity of all the stakeholders will be developed for creating a conductive environment for the private sector investment, including the introduction and adaptation to local conditions of proven (i) mini grid and standalone technical concepts to reduce technological risk, (ii) business models and market development strategies that have been successful in East Africa as PAYGO and rental, (iii) and financial instruments to support the development of the market (grant for technical assistance and result based finance for market penetration).

2.1.1. Technical approaches and concepts for unlocking the off-grid market

Baseline

The World Bank Group (2012-13 PPIAF) conducted a technical, economic, and financial feasibility analysis for electrification through solar energy of 25 rural villages in Djibouti with the view of addressing energy access and better manage water scarcity, safety and well-being of vulnerable populations in rural areas of Djibouti. This study produced a technical, economic, and financial feasibility analysis to assess the most viable and sustainable roll-out option available to electrify each of Djibouti's 25 rural villages targeted including (i) a pre-feasibility analysis, (ii) public-private partnership (PPP) option and PPP operations and maintenance contract structuring recommendations, (iii) recommendation for legal/regulatory changes including the identification of appropriate contractual and governance arrangements to incentive the private sector operator to maintain the mini-grid,

ensure a reliable supply and to extend the mini-grid, (iv) plans/strategies including a census update and pilot prioritization plans and (iv) workshops/seminars/public meetings including pilot project appraisal and trainings.

The importance of clear policy for the uptake of the off-grid market

The establishment of a robust policy framework for off gird solutions helps to create certainty, increase the predictability of the policy environment, and attract investment. The absence of a strong policy framework for off gird solutions create uncertainty and a perception of risk which deters investment. Ambiguous wording of policy, inconsistency in policy statements from individual decision-makers or lack of clarity around roles and responsibilities of different government agencies contribute to a higher perception of risk. Sudden changes in policy, especially those which have a direct impact on the cost of business such as changes in taxation, can undermine confidence in a government's commitment to promoting market growth.

Inclusion of grid, mini-grid and off-grid solutions in electrification strategies, as part of an integrated approach, is the key to developing effective electricity access solutions. Geospatial planning techniques should be used to analyses a range of factors which influence the most cost-efficient way to connect communities – including the size of the community, population density, distance to national grid, terrain and level of economic activity. Based on such analysis governments can make more informed decisions about the appropriate mix of grid, mini-grid and off-grid solutions to deploy, whilst also factoring in other considerations such as availability of funding, broader macroeconomic conditions and government priorities. Setting targets, based on the multi-tier framework, can send a powerful signal to companies and investors that a government is committed to creating the conditions for off-grid solar market growth. This is especially the case, if targets are timebound and accompanied by geospatial plans showing where grid, mini-grid and standalone solutions are to be deployed. Whilst targets should take account of government ambitions for energy access, it is also important to consider household electricity needs, as well as ability and willingness to pay. Multi-tier framework surveys, outlined in more detail below, can help to set targets in a way that takes account of all these factors.

A valuable new tool for electrification planning is geospatial modelling. This can compare the relative cost of different technology options – on-grid (grid expansion), solar mini-grids, or solar home systems – based on factors including the target level of electricity access (anticipated demand/service levels), pre-existing and planned grid and generation infrastructure, population density, local renewable energy resources, household budgets, technology learning curves, and fuel costs (IEA, 2017; Van Ruijven et al, (2012); Nerini et al (2016).

Until a few years ago, geospatial modelling was prohibitively expensive due to resource intensive data gathering. In recent years however, low cost modelling options, such as KTH-dESA's OpeN Source Spatial Electrification Toolkit (ONSSET), have now become available, marrying geographic information systems (GIS) and open access geospatial data.

Such geospatial analyses of least-cost electrification options incorporating local characteristics have been used by the IEA (2017) in its World Economic Outlook, where it has been used to model technology options to achieve universal electricity access by 2030 in sub-Saharan Africa, to a resolution of 1km squared.

The project will create a supportive policy environment for energy access, in particular for off-grid solar home systems', and 'where Djibouti lags on establishing the regulatory framework to support off-grid access through solar home systems and other distributed resources. Regulations that clarify market entry and exit, define minimum quality standards, and target subsidies and duty exemptions should be considered for supporting off-grid solutions and enabling countries to benefit from the plummeting costs of decentralized solutions based on solar photovoltaics

Policy good practices

There is a connection between off-grid solar market size, and the energy access policy and regulatory environment:

- adopting good practices to scale-up energy access.
- there is a national program to promote adoption of off-grid technologies;
- there are subsidies or duty exemptions in place;
- there is no legal limit on the price stand-alone home system retailers and service providers can charge; d. there is formal adoption of international quality standards and test methods

Using public funding to support growth and minimize the risk of distortion

Public funding has a vital role to play in accelerating the off-grid market growth. Publicly funded awareness campaigns, results-based or concessional financing schemes, tax exemptions, or efforts to promote quality in the market, are all widely supported within the sector. These measures require government investment in the short-term but deliver a significant pay-off in the long term.

Good public funding schemes are simple, predictable, reliable and transparent. They are designed in partnership with industry, and based on a solid understanding of market barriers. They focus on replicating and scaling proven solutions, and are delivered at scale over the long term to ensure they have a meaningful and lasting impact. Technology should be used to minimize administration and transaction costs for businesses, and robust data collection systems should be used to track progress and monitor impact.

In Djibouti, the government subsidizes end-user prices or distribute products for free in areas where companies are seeking to sell products, this can distort the market, signaling to customers that they do not have to pay full retail price, or pay at all. Customers may hold out for reduced-cost or free goods in future, and are more likely to default. This undermines the commercial viability of off-grid companies, and discourages future investment. Free distribution schemes rarely lead to sustainable outcomes, whilst if customers make a financial contribution to system cost, a sense of ownership is created which supports sustainability in the longer term.

Public funding should be used to accelerate expansion of the commercial market, to all geographical areas that companies can viably serve, and to all customers that can afford to buy. The figure below shows how public funding can be used to build demand and willingness to pay, support consumer choice, 'crowd in' private investment, and minimize market distortion.

Figure 1 Use of public funding for market growth and to minimize market distortions

These interventions focus on reducing 'upstream' risks and costs for businesses, so that they do not undermine 'downstream' consumer price expectations and willingness to pay. They are explored in more detail in other guidance notes in this series.

Lower taxation to improve affordability

Consumers across all income brackets are price sensitive and the with willingness to pay is closely linked to price. VAT and import tariffs on solar products can be as high as 40% of the cost of goods in Djibouti, raising prices and putting off-grid products and services out of reach.

Experience from Kenya learns that the business case for customers to switch from kerosene, battery-powered torches or candles to solar lighting is compelling. Basic solar lights can 'pay for themselves' through savings in around 10 weeks when they replace kerosene lamps. The monthly repayments for many PAYG solar products are similar to, or only slightly more than previous spending on inefficient lighting, whilst offering a far higher level of modern energy service. Despite this, a major barrier to market growth is affordability of standalone solar products, services and related appliances. Basic solar lights are affordable for all but the extreme poor, whilst solar home systems are affordable for only a proportion of those living below the poverty line. Data collected by the social enterprise, Solar Aid, in Kenya, Malawi, Tanzania, Uganda and Zambia shows that 82% of customers buying basic $10 solar lights live below the $3.10 poverty line. Looking across five SHS and mini-grid companies, Acumen finds that around 36% of customers live below the poverty line of the poorer customers who need them most. The increase in uptake due to reduced product prices can be significant. A study in Kenya found that reducing the price of a solar lamp from $7 to $4 increased household uptake from 37% to 69% Lighting Africa finds that, even after using a product for just one week at home, the price customers said they would be willing to pay tripled.

In a competitive, price-sensitive market, achieving significant sales volumes - and the economies of scale that come with high volumes - is vital to business success. Competition forces companies to pass on savings from lower taxation, to consumers in the form of lower prices. The temporary or permanent removal of VAT and tariffs – covering the entire product, including any appliances - is one of the most effective ways to support the growth of off-grid market in Djibouti, improving affordability, boosting uptake and accelerating energy access. Efficient appliances can make up around 40% of the overall product cost (Figure 25). Tax exemptions on these parts in particular help to keep prices affordable for consumers. VAT and import tariff exemptions have been a major driver of market growth all over the world. In Africa, Kenya, Tanzania, Uganda and Rwanda have all

utilized exemptions to drive growth – these four countries alone account for over 25% of worldwide market share.

Promoting Quality to Protect Consumers

Djibouti is not yet equipped to filter and control the quality and performance of the off-grid appliances entering the country. Promoting quality helps to build trust in off-grid technology, creates demand, accelerates market growth, delivering energy access, household savings and broader social impact. Low quality products - especially counterfeits or those which falsely claim to provide a level of service which they do not deliver - undermine trust, reducing demand and damaging the market. These products imitate the look and feel of respected brands but use inferior technology, often leading to early failure.
The Global LEAP program shows that a missing quality assurance framework has a significant negative impact on market growth and therefore uptake of household solar technologies. Strong growth can only be sustained if there is a robust quality assurance framework.

Djibouti need to adopt an internationally harmonized quality standards, and the test methods outlined in IEC Technical Specification 62257-9-5, as well as accepting testing done in another country. The IEC standards are kept up to date as new technology and new products emerge. It is cheaper and more efficient to conduct testing through IEC-accredited test laboratories around the world, than to establish

Promoting Repair and Recycling to Improve Sustainability

The off-grid market is a growing producer of electrical waste including batteries. Managing discarded electronic appliances, known as 'e-waste' or 'Waste Electrical and Electronic Equipment (WEEE)', is will be a growing challenge for the government of Djibouti and locales businesses. There will be a need to put together in place a robust e-waste management system.
Regulation around repair and recycling in the off-grid solar sector needs to be commensurate with the small volumes of e-waste generated by the sector. Companies are not yet able to bear the full cost of establishing e-waste value chains, without passing these costs on to consumers, creating the risk that higher prices might undermine market growth. It is recommended that:

- Governments recognize the difference between the small, emerging standalone solar market, where products of low intrinsic value cannot be viably recycled without financial incentives, and larger, more established electronic industries. They can exclude standalone solar from broader e-waste initiatives, or develop alternative frameworks specifically for the standalone solar sector.
- Ensure policy is clear, and implemented in a coordinated way across multiple government ministries. For example, Ministries of Energy need to coordinate with Ministries of Environment, that are often responsible for e-waste legislation.
- Provide financial incentives to customers or companies, so that products with low intrinsic value, such as solar lights and solar home systems, can be collected and recycled as part of broader e-waste initiatives, without imposing significant additional costs on companies and end-users.
- Support consumer engagement efforts, to encourage safe disposal and recycling. For example, government agencies and companies in Kenya are responding positively to contractual arrangements for e-waste disposal.

Global market development and trends

The development of the off-grid (mini grid as well as standalone) market has been very robust over the last years with some East African countries such as Kenya, Uganda, Ethiopia and Tanzania paving the way. Googla (2018) reports that in 2017, the global off-grid solar (OGS) sector has provided improved electricity access to an estimated 73 million households, or over 360 million people, thus transforming

lives that were previously reliant on kerosene and solid fuels for most of their lighting needs. This expansion is due to several factors among other:

- Emergence of three product categories (pico, plug-and-play SHS, and component-based systems), catering to lighting and beyond (e.g. communication, cooling, entertainment, refrigeration), and two distinct business models (cash-based versus Pay-As-You-Go).
- Emergence of multiple product categories sold via cash and Pay-As-You-Go (PAYGO) business models and expanding beyond lighting to increasingly include off-grid appliances.
- Significant market entry and private sector engagement from an increasingly diverse, global pool of manufacturers and distributors.
- Increasing interest and commitments from investors, including more than USD 500 million raised between 2016 and 2017.
- Growing acknowledgement from governments and development institutions who are committing significant resources to the sector.
- Approximately USD 5.2 billion in economic savings to households as they switch from kerosene and/or other conventional fuels to affiliate OGS devices. When considering the entire universe of OGS devices, which includes non-affiliate products and component-based systems, total savings could be more than double.
- 28.6 million tons of greenhouse gas emissions have been avoided through the reduced use of traditional lighting sources due to the uptake of affiliate devices.14 When considering the entire universe of OGS devices, emissions avoided are likely to be substantially higher.
- Across geographies, an estimated 1.9 million people have used OGS devices to support income generating activities.
- Improved health reported by 45% of OGS users who previously used kerosene, especially regarding respiratory and eye issues, and reductions in burns and accidents.

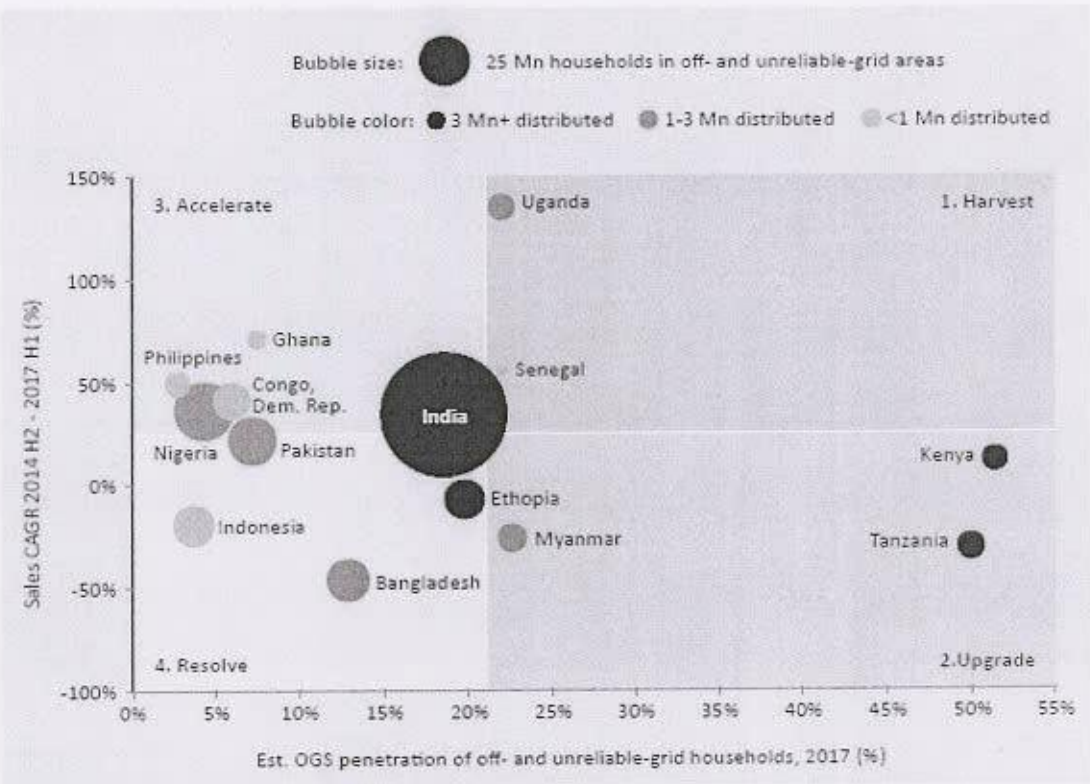
Future trends

The OGS sector is expected to provide or improve the current energy access to 740 million people in 2022, compared to 360 million in 2017. Annual revenues of the off-grid service providers will grow to around USD 8 billion with a CAGR (Compound annual growth rate) of 25% in terms of units sold with revenues expected to rise faster.

Table 3 Estimated sales and revenues across OGS segments (% annual growth; units; USD (2010-2022)

	2016				2022 Est.		
	Sales units sales (2010-2016)	Annual unit revenue	Annual CAGR (USD)		Sales units CAGR (2017-2022)	Annual unit sales	Annual revenue (USD)
Pico	~99%		26 Mn	$600-650	~16%	47 Mn	$1-1.5 Bn
PnP SHS	~125%[40]		<1 Mn	$150-200	~87%	24 Mn	$6-7 Bn
Open-market	n/a		2-2.5 Mn	$200-250	n/a	2-2.5 Mn	$200-250 Mn
TOTAL	~100%		~30 Mn	~$1 Bn	~25%	~72 Mn	~$8 Bn

Figure 2: Estimated sales and penetration of OGS devices in select markets in % (2014 H2 - 2017 H1)



Market strategies

The energy ladder, derived from the Maslow pyramid, provides a view of the energy demand varying from the typical household uses to that of the more sophisticated need for productive use.

Figure 3: The energy ladder

To meet this varying demand, mini grid as well small standalones are both needed, depending of the expressed demand. The growth of both concepts has been robust in East Africa in recent years. The observations drawn in the Region revealed that several marketing strategies are used to the develop the market.

- *Harvest:* Markets where sales continue to rise despite relatively high penetration, suggesting that suppliers can continue to harvest revenues.
- *Upgrade:* Highly penetrated maturing markets, where suppliers may consider upgrading existing customers to higher quality technologies and service levels, and should seek innovative distribution
- *Accelerate:* Up-and-coming markets which show promising growth and where suppliers can continue to scale operations to take advantage of large unpenetrated populations.
- *Resolve:* Under-penetrated markets which have seen sales fall, and which would need concentrated supplier investment to resolve context-specific issues.

Currently, applicable marketing strategies in Djibouti to develop the mini grid and SHS are:

- *Accelerate* in the peri urban segment. Several dealer and distributors are already active in this market services a variety of customers including the underserved (not grid connected) and those that can afford to acquire solar systems to improve the quality of the electricity and lower the cost. A few customers (NGOs, institutions and household) make the choice of solar product for environmental purposes.
- *Resolve* for the rural underserved population. This segment is completely underserved. A large variety of tools (rural electrification concession, mandate, PAYGO can be deployed to ease access to electricity using the energy ladder (from basic lighting need to productive use) as outlined in the figure below

The addressable market in Djibouti

While affordability remains key for low-income consumers there are robust opportunities available in the addressable market for off-grid systems in Djibouti. Affordability varies whether one is considering a market entry level related to pico system (solar lamps for instance), PAYGO SHS system or mini grid connection. The potential value of the addressable market, which varies for each device size and cost, ranges from USD 720 million to almost USD 19 billion according to. This estimation assumes that consumers can divert 60% of their current spending on "Other Fuels" (comprising lighting, cooking and heating fuels), and 70% of their spending on household appliances in a given three-month period toward purchases of off-grid solar devices. If a consumer's spending in these categories exceeds the upfront cash price or PAYGO deposit of a solar device, they are assumed to be addressable.

Determination of the addressable off-grid market in Djibouti

The project assumes that the levels of price / cost outlined in the figure above are relevant to the targeted population in Djibouti that are currently underserved in rural and peri urban areas. The off-grid market tin Djibouti includes peri urban and rural populations. It is estimated that 70% of roughly 900 000 inhabitants' lives in urban center against 30% in rural areas.

Total	urban	Rural	Total poo	Households
	70%	30%		6 pers/ hh
Total pop	630,000	270,000	900,000	150,000
underserved	283,500	243,000	526,500	87,750
partial switch to solar	121,500	81,000	202,500	33,750

Total market	405,000	324,000	729,000	121,500

45% of the urban population is not connected to the grid. About 90% of the underserved in rural areas can be reached with OGS. A good segment (minimum 30%) of the served population can partially be addressed with OGS to reduce electricity bills or increase power reliability.
The direct addressable market for OGS is estimated to 729 999 inhabitants with various marketing options and financial instruments (PAYGO, rental, loans for up-front cash payment) are deployed whether under a mini grid system or a SHS. Another segment to consider in Djibouti will be the publics institutions such as rural clinics and schools.

Household spending

A majority of Djiboutian households rely on dirty and expensive fuels to address and supplement their basic energy needs. These include kerosene, candles, dry-cell battery torches for lower levels of service, and diesel generators for higher levels of service. These households pay heavily for their limited access, since most traditional fuels are far more expensive than electricity or other modern solutions.

Off-grid and unreliable-grid households can spend up to the equivalent of USD 100/kWh for lighting through kerosene, which is about 1,000 times more than what on-grid customers pay. In Kenya, for example, an on-grid household can spend up to USD 0.73 per month for lighting, while kerosene users can spend as much as 20 times more (USD 14 per month) for substantially less service. IRENA estimated that expenditure for off-grid lighting and mobile phone charging in Africa can range between USD 84 in Ethiopia, and USD 270 in Mauritania, which is between 3-5% of annual household expenses. This does not account for transportation costs for trips dedicated to mobile phone charging, which can amount to USD 25 per month in some cases.

In Djibouti, the average spending on EdD grid electricity and traditional fuel is among the highest in Africa. Grid electricity cost takes up an average of 30 to 40 % of the household in Djibouti-city, therefore the average power consumption remains very low in a reflex to save costs. On rural areas, the social tariff remains even higher than the normal tariff in surrounding countries of Kenya, Ethiopia.

Financial Options for promoting the off-grid market

The key learnings in East Africa reveal the following findings to ease the inventory of the model that are potentially transposable in Djibouti:

- *Capital flows:* the off-grid sector (OGS) has seen a dramatic increase in funding. East Africa has been the primary recipient of funds, although West Africa have also gained traction. Fundraising in the OGS sector has doubled annually between 2012 and 2016, with annual investments touching USD 317 million in 2016.

- *Sources of capital:* Debt has gained prominence. Commercially focused funders and crowdfunding have emerged, while local capital remains limited; social investors may refocus to maximize impact. DFIs have provided a cumulative share of ~25% of total funding since 2012. They are driven primarily by their search for additionality, a term that in this case pertains to providing financing where other funders are not willing to venture.

- *Impact investors* provide between a quarter and a half of total funding annually. Impact investors invest and lend through funds, which they use to raise capital from their own investors. Given that

they fundraise from multiple sources, they have access to a large pool of investable funds and can raise capital quickly if needed.

- *Crowdfunding platforms* connect OGS companies with socially conscious individual investors that may be looking to invest in impactful projects. Given the social focus of these investors, they accept lower returns than would be expected from similarly sized commercial loans.

- *Commercial equity.* Rapid growth has attracted commercial equity investors to PAYGO SHS companies with proven business models and clear pathways to profitability. Generally, these investors place a premium on strategies designed to own customer relationships and create intellectual property.

- *Commercial debt:* Commercial debt funders largely consist of local banks, and local branches/subsidiaries of international banks. Other participants could include investors buying into public debt offerings such as a bond or a securitization transaction (although public debt offerings have yet to develop as the industry still remains young).

In Djibouti, internal and external funding requirements are expected to grow substantially, as a large gap remains. The marketplace will require new sources of capital, including commercial finance (both debt and equity).

Customer financing

With regard to consumer financing, MFI-based product loans have been supplanted by PAYGO models, which have become mainstream in countries that have an enabling ecosystem of mobile money and conducive regulation. East Africa is particularly fertile ground for PAYGO given the high penetration of mobile money in the region. While mobile money is not necessary for PAYGO, it has the potential to enable and accelerate its uptake significantly by providing a ready platform to use for payments, collections, monitoring usage, and even assessing risk.

The strong development of PAYGO is East Africa is contingent to the digital finance penetration which is rather weak in Djibouti due the full monopoly of the telecom company The PAYGO model is essentially four core activities —product design/assembly, distribution, platform technology, and banking—combined into one. As it is difficult to excel across all four, the business model and customer offering is shaped by operators' choices on a range of core questions and dimensions. These questions include what position to ideally take in the value chain, whether to develop a PAYGO platform in-house or purchase technology from a third party, and what mode(s) of payment to support. Choices are often driven by geographical limitations—for example, mobile-based payments are restricted to geographies that have mobile money infrastructure and penetration.

- *Financing model:* A majority of industry players are providing a lease-to-own financing model with a payment period of less than two years. Transfer of ownership acts as an incentive for customers to complete payments; many off-grid customers are not used to the idea of paying for energy as a service (as in a perpetual lease model) and require this incentive. The incentive is often most effective when the prospective timeline to ownership is short, thus reducing the risk of defaults. Striking a balance between affordable monthly instalments and short lease lengths is more complicated for larger systems (above 50W) given their higher overall cost of ownership, leading their payments to be typically spread over more than two years.
- *Payment process:* In East Africa, almost all PAYGO providers rely on mobile money. However, this mode of payment is complicated by lower penetration of mobile money as the case of the Djibouti. Therefore, the services providers in Djibouti will need to accommodate payments through mobile airtime. Another option will the traditional on cash-payments through local agents. This led to

accrued cost arising from agent commissions, transportation, security, and administrative costs for tracking payments—which increase as operations move to less dense areas.

Tariff setting

Tariff settings: Break-even tariff levels are 0.45 US$/kWh with 90% investment subsidies

Countries that face the most severe affordability issues for electricity are typically small island states, small landlocked states, and conflict-affected areas that face high power generation costs. Djibouti, because of the small size of its population, small market, low density grid can be categorized in the small islands states category with very high cost for generating electricity. The WB sponsored studies developed a simplified financial model for the mini-grid system based on the capital cost requirements, future replacement of parts (e.g. batteries and inverters), operation and maintenance costs, fuel costs and the collection of revenue. The model was used to assess the sensitivity of the project's net present value (NPV) to changes in tariff levels and their associated parameters. Two tariff scenarios were analyzed:

- 0.58 US$/kWh and a 30-40% non-payment from low income and some middle-income households.
- ADDS social tariff of 0.22 US$/kWh and non-payment rates of 10-20%.

Assuming an investment subsidy of 90%, the tariff scenario of 0.58 US$/kWh would result in a positive NPV (+45,308 US$). With the ADDS social tariff the NPV would be negative at -21,280 US$. The average tariff needed to break even is US$ 0.45/kWh.

Based on ability to pay the proposed rate should be feasible for high- and medium-income households but too high for low income households. The average monthly bill would however be lower than current average expenditure, suggesting that a certain level of cross subsidy should be possible.

3. RESULTS AND PARTNERSHIPS

The project consists of 2 components as outlined below. On the top of the project own permanent team, internal and national consultant will be hired to support in various specialization: regulation, tariff, norms and standards, O&M procedures, communication, etc.

PROJECTS COMPONENTS

The project consists of the two interrelated components; (i) Institutional Framework, Policy Instruments and Financial Incentives Scheme for Sustainable Off-Grid Technologies and Delivery Models (ii) Showcasing Solar-battery mini-grids. Overall, these two components will seek to advance the development of the sutainable off-grid sector in Djibouti, with private sector business models and capital central to this vision.

COMPONENT 1: POLICY AND FINANCIAL INSTRUMENTS, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT AND INCENTIVE SCHEME FOR SUSTAINABLE OFF-GRID TECHNOLOGIES AND DELIVERY MODELS

This component will develop a set of institutional, policy and financial instruments and incentive schemes. It envisages the preparation and adoption of an adapted institutional framework and comprehensive policy framework for the promotion of off-grid electrification with the use of renewable energy. Under the leadership of the Ministry in charge of environment (MHUEAT), a dialogue and consultation process is expected to lead to a performing institutional setting for the uptake and successful implementation of the project with the appropriate use of local competencies and the full participation of

all the relevant institutions specialized in energy access, environment, gender & social inclusion and rural development.

The policy framework will complement existing strategies on power sector development and rural electrification by putting explicit emphasis on, and providing more favorable conditions for, decentralized RE technologies and for the uptake of the market of the off-grid sector. The policy framework will include specific timeframes, targets and roll-out plans for the development of mini-grids and standalone systems. Off-grid environmental, gender and social inclusion guidelines and regulation will be part of the deliverables. In order to support the implementation of the proposed policy framework, a capacity building program will be provided to relevant national agencies and directorates, potential private-sector and community groups.

Outcome 1: A clear and simple institutional setting and arrangements to streamline off-grid electrification.

This set of activities will deal with the definition of a solid and transparent institutional setting for off-grid electrification outlining the different roles and responsibilities of the different institutions, organizations and operators in the implementation of the regulatory framework. Due to the nature of the project, various skills and competencies from diverse ministries and public & private institutions will be required to safeguard the project expectations. Besides the aspects related to energy access, the environmental dimension, gender and social equity components and the economic empowerment of targeted population are essential ingredients for successful implementation.

The expected outputs are:

Output 1.1: Comprehensive but simplified regulatory framework to unlock off-grid the market

The preliminary arrangements can be described as follow: (i) the Ministry of Housing, Urban Planning and Environment of Djibouti (MHUEAT) will carry the political and administrative responsibilities for the entire project, (ii) MHUEAT will create a steering committee together with all relevant institutions in the country (Ministry of Energy, EdD, the Social Development Agency of Djibouti, l'Agence Djiboutienne de Maitrise de l'Energie, la Commission Nationale de l'Energie, CERD) to guide the project implementation; (iii) the Ministry of Energy and Natural Resources (MERN) that is responsible for formulating and implementing the Government's policy in the field of energy, will be entrusted for the adequacy with the countries energy policies and regulation to ease the implementation of the project; (iv) capacity building for each involved institutions and communities to understand and carry out its responsibilities adequality. Local expertise (consultants) will be mobilized in priority for assisting the involved institutions to fulfil their duties and responsibilities.

This output will consist mainly on:

(1) Adoption of *off-grid model to simplify the regulation*. The current demand for electricity, both household and productive use in Djibouti is quite low can be estimated an average of 200 kW per village. The basis for regulation in Djibouti could be as simple as one need a license only if the capacity is more than more than 200 kW. In that case, there will be only two categories of off-grid determined by a capacity that less or equal 200 kW or more than 200 kW. For category 1: < 200 kW, only an authorization or a form of declaration, light ESIA is required. For category 2: > 200 kW, concession regime, Standard ESIA

(2) Formulation and adoption ***off-grid law*** outlining the legal basis for off-grid (stand alone and mini grid) policy to be adopted by the national parliament. The law will specify the entire procedure for authorization and licensing of concession together with the technical,

administrative, fiscal requirements and the obligations of the service providers. The law provides the requirements related to the construction, operation and maintenance of the systems, the technical norms for products and processes, procedures for connecting customers and the environmental and social requirements

(3) Formulation and adoption of ***regulation instruments*** including decrees and procedures to streamline, clarify and ease investment in the sector: simplified standard procedures for the application and the granting of the contractual documents (concession agreement, license, authorization, granting of fiscal advantages); the tariff setting methodology and procedure, licensing criteria and processes, ESIA, gender and social inclusion requirements.

The following activities will be carried out:

- Build a conductive environment to accelerate the electrification of "unserved" and "underserved" populations in rural and urban settlements with off-grid renewable energy;
- Promote the engagement of the private sector, local communities and grassroots communities, NGOs and other stakeholders in the implementation of the country's electrification strategy and plans;
- Reduce the administrative burden faced by potential off-grid contractors / operators by simplifying the procedures for obtaining and operating title and tariff approval;
- Model contracts and the tendering process for the implementation of off-grid projects. Norms, standards and labels based on CEI (commission electro technique international) prescriptions for the conception, construction and operation of off-grid systems;
- Safety procedures and quality of assurance that must be applied to off-grid subsectors (appliances as well process);

Output 1.2: Tariff setting, and design of financial support.

Setting financially viable tariffs to obtain the adequate energy price will be an important factor to ensure sustainability. Under Component 1, the project will assist the Ministry of Energy (MERN) with developing and introducing a new regulation for decentralized RE tariffs. It is proposed that the mini-grid tariff system have a graded tariff regime, similar to the system in place for the main grid system. This will allow the tariffs to be set in better proportion to the customer's ability to pay. As most of the planned mini-grids will be fairly small in terms of the user-base, there will be natural constraints on how differentiated the tariff levels can be. Also, since most customers will be poor, it is envisaged that productive uses (businesses) will shoulder a disproportionate burden of electricity cost-recovery. A national policy will be developed to resolve the issue of very low Government controlled tariffs.

As indicated earlier, the current tariff paid by grid-connected consumers in Djibouti is 45 cents US$/kWh (22 cents for ADDS subsidized social tariff). This level of tariff, should, in principle, be sufficient to make investment in wind and solar PV commercially viable. The project will help to run financial models to better determine the financial viability of different tariff options. The project will conduct a comprehensive assessment that will balance the requirements for minimizing subsidies, ensuring adequate rates of return for investors and respecting the social electrification objectives set by the Government.

The set of deliveries will involve the following specific tools and instruments to unlock the market and contribute to the long-term sustainability of the projects that will be implemented:

- Detailed methodology for tariff setting of the various off-grid categories (reflecting the cost or nationwide tariff);
- Tax and financial incentives for promoting off-grid electrification;
- Guidelines for the technical, commercial and financial management of the EHR for the benefit of the developers / operators of the HER;

- Financial modelling for each category of off-grid considering the demand, projected sales, OPEX, CAPEX, EBITDA and IRR on invested capital;
- Easing project finance through grant or RBF schemes on the base of the tariff and financial model excluding guarantee funds according to GEF rules

Output 1.3 Environment, gender and social inclusion

- Under the guidance of the Ministry of social affairs and family, a national framework for gender and social inclusion for off-grid electrification will drafted within a participatory approach involving all the users and beneficiary of off-grid systems. Such framework will specify the needs and constraints to be taken into account for the design, erection and operation of energy access project in rural areas. It will set targets and compliances criteria that are measurables and easily monitored in conformity with the best practices on the international scene;
- A national framework for ensuring environmentally sound practices in off-grid electrification including standards and labeling to avoid poor quality products, requirements for environmental impact assessment according to the project specificities. Especially strict guidelines will be elaborated for waste recycling as such industries generate lot of electronical waste. Special emphasis will be put on the batteries recycling.

Output 1.4: Training, Capacity building programmes and knowledge management

Through this output, the project will work on a market structure that should has the right balance between international and local firms, in order to develop and build skills and expertise and the country level.

Djibouti faces a high rate of underachievement related to poorly maintained and run mini grid solar systems for rural electrification. Based on lessons learned from existing projects in Djibouti, the fundamental requirement of any program is to provide incentives for follow-on after sales support. Many rural electrification projects fail because insufficient thought was given to the need for on-going maintenance. Suppliers or other agencies must have the appropriate incentives or obligations to maintain the equipment. This can be through contractual obligations, but enforcement must be possible. Alternatively, financial incentives may also be possible, or it may be possible to contract a firm or agency with responsibility for providing a roaming maintenance service (as is the case in Djibouti with solar equipment used by clinics).

A review of the 3 existing solar mini grid shows shortcomings in terms of delivery model (lack of O&M model, poor involvement of the beneficiaries in the project design and operation, no provision for financial sustainability). To prevent such occurrence, the following instruments will be designed and made mandatory for each supported project.

- Guidelines for communities' mobilizations and involvements; customer relations and conflict resolution procedures in case of illegal connections or theft, engagement of productive end-users, etc.
- Guidelines and recommendations for technical oversight over plant operations and responsibility for repairing faulty equipment;
- Practical guide to accounting and administrative and financial management of off-grid systems, billing and payment collection system;

There is an overall lack of expertise in the conception, design, implementation and operation of mini grid in Djibouti. There is a need to train skilled experts and technician in renewable energy technology in Djibouti. Against this background, the project will facilitate the following:

- Training of policy makers and government institutions to evaluate the needs (policy gap) and formulate appropriate policies and regulation for unlocking the off-grid market
- Training program to develop / upgrade the technical skills for off-grid project preparation, implementation, O&M and monitoring;
- Training of local institution on monitoring and evaluation of off-grid projects
- Assisting local education facilities to develop curriculum related to renewable energy technologies at different level: master, engineer, technician and skilled labor
- Positioning 2 to 3 Technical assistants specialized in off-grid regulation, tariff setting and technical norms.
- Developing expertise for systematic best practices information collection, processing and presentation

COMPONENT 2: SHOWCASING SOLAR-BATTERY MINI-GRIDS

Outcome 2: Solar battery mini-grids is developed in the country, reaching 1 MW installed capacity

To demonstrate the outcomes of the component 1, the project will support a pilot solar-battery mini-grid to electrify a model village of 100 households about. The mini-grid system will meet the electricity need of the households, the local school and few productive uses such a bakery, water pumping and a grocery. Productive use will be a key element of the pilot, creating a virtuous cycle where increasing demand for the mini-grid's electricity generation will improve its financial viability, resulting in lower tariffs for end-users.

Output 2.1 Showcasing a successful off-grid rural electrification models for setting standards for, duplication and dissemination with the electrification of 100 households and productive use

To electrify a model village through solar mini grid system to using all the tools and instruments developed in the Component 1. This activity will test and validate all the concepts, policy and other instruments deployed by the project. If needed, it will provide feedback to Project Management Unit with useful information than can be used correct or rectify certain aspects of the policies and approached formulated in the project phase one (Component 1). The maintain purpose is to set up a standard for rural electrification in term of population implication, project design, technical approach, O&M&M and potential for replication

The estimated generating capacity is set at 132,5 kWp for an average yield of 795 kWh/day. This electricity will power 100 households, a school, a bakery, a grocery and a water pumping station to meet the needs of the households, education and income generation. The overall estimated cost is USD 700,000.

In addition, through this output, the project will promote productive uses such as rechargeable batteries, cooling systems for fisheries and fresh water, in order to create more energy demand, but also to overcome the capacity and willingness to pay of local population. The third-party ownership model will be explored where the mini-grid operator acquires the equipments and leases it back to the beneficiaries.

HOUSEHOLDS

Equipments	Qty	Power need per unit (W)	Total needs (W)	Number of hours per day (h/d)	Total consumed power per day (Wh/j)
Light	600	20	12,000	5	60,000
Ventilation	200	80	16,000	5	80,000
Tv/Décodeur	50	350	17,500	5	87,500
Radio/ Phone charge	100	100	10,000	5	50,000
Refrigeration	50	200	10,000	5	50,000
others	50	200	10,000	1	10,000
Total		**950**	**75,500**		**337,500**

ECOLE					
Equipments	Qty	Power need per unit (W)	Total needs (W)	Number of hours per day (h/d)	Total consumed power per day (Wh/j)
Light	75	20	1 500	5	7 500
Ventilation	40	80	3 200	5	16 000
Computer / Printer	3	350	1 050	5	5 250
Other	2	200	400	3	1 200
Total		**650**	**6 150**		**29 950**

Productive use					
Equipments	Qty	Power need per unit (W)	Total needs (W)	Number of hours per day (h/d)	Total consumed power per day (Wh/j)
Bakery	1	8 000	8 000	6	48 000
Grocery	5	2 100	10 500	6	63 000
Water pumping	1	13 000	13 000	6	78 000
Total		**23 100**	**31 500**		**189 000**

Total electricity demand :	**556 450**	**Wh/day**

Sizing of the generation plant

Daily power need (Wh)	**556,450**
Required solar energy yields	794,929
Required generating capacity (W)	**132,488**
Estimated solar panel	**883**
Required areal (m^2)	**2,685**
Need for storage (batteries) (Ah)	**289,818**
Numbers of batteries	**1,449**

Investment needs (CAPEX)

	Unit Price Fdj	Qties	total Fdj	Total US$
Solar panels solaire 250 W	35,000	883	30,913,889	174,655
Batteries 200 Ah	50,000	1,449	72,454,427	409,347
Inverter 65 000 W	965,000	2	2,130,850	12,039
Cable	1,500,000	1	1,500,000	8,475
Aluminium Framework	4,500,000	1	4,500,000	25,424
Main d'œuvre	1,140, 000	1	1,140, 000	6,441
	Total		112,639,166	**636, 379**

10% VAT ($)	**63, 638**

TOTAL ($)	**700, 017**

Output 2.2: Replication Plan to implement outreach/promotional activities targeting both domestic and international investors

By showcasing the installation of 132 kWp, costing around USD 700,000; the project through this output will work on replicating the model and building the ground for more investment in the sector. By aggregating the GEF funding and co-financing amount of Component 2, USD 4,650,000 is therefor available and will be channeled towards replicating the model to reach roughly 1 MW total capacity.

Beyond the 1 MW capacity, interest of investors has been seen in developing up to 5 MW in mini-grid and stands alone systems over the next 5 years following project completion.

Djibouti is not yet benefiting fully from the many available sources of finance for developing the renewable sector due to lack of enabling policies and attractive environment for the private sector. Therefore, there is a need to promote the country potential. The related activities will consist of for coordinating the various intervention of the Technical and Financial Partners (TFP) and leveraging parallel finance. During the formulation mission, several options were identified including the World Bank (USD 400,000) GiZ/IGAD (EURO 4,000,000), Japan government private window (USD 10,000,000), Private sector (PAYGO providers USD 1,000,000); EU TAF for 2 to 3 technical assistants to support the Government.

EXPECTED RESULTS

Leverage large contribution of the private sector in financing and operating renewable off-grid electrification systems through:

- the establishment of a robust, effective but simplified legal, regulatory, fiscal and tariff framework, contributing to the de-risking of the sector by reducing the perception of financial risks;
- support the private sector by seeking a judicious use of public money or ODA;
- securing services providers' revenue levels through a transparent and simplified tariff that reflects the real costs;
- promotion of professionalism (skills development and excellence) among all private and public player's trough technical assistance and training;

Ensure that off-grid electrification contributes fully to the overall objectives of the Vision 2035 of Djibouti (100% renewable)

- promote the productive use of electricity;
- treat all subscribers equally and in a non-discriminatory manner;
- ensure respect for regional equity and equity of access in the same locality;
- promote optimal use of all sources of renewable energy;

Establish a technical regulation to ensure a quality off-grid electricity service, based on the certification of product quality, qualified technicians and sound environmental regulations for recycling waste.

- develop and enforce minimum service standards for all off-grid products and process;
- develop and enforce equipment quality standards;
- develop and enforce technical standards (technical minima and technical regulations);

- develop an environmental regulation of the off-grid allowing recycling and efficient treatment of all the waste produced by its sectors.

Showcasing and scaling up sustainable models of sustainable off-grid electrification

- full application of the developed policies and instruments through the electrify a village that will serve as standard model in the country
- leverage cofinancing through various technical and financial partners to provide at least 1 MW solar capacity trough rural electrification and the use of SHS in urban areas
- To reach at term 10,000 inhabitants

Knowledge sharing

- Systematic review and documentation of best practices
- Information sharing through various medium to promote off-grid electricity

GLOBAL ENVIRONMENTAL BENEFITS (GEFTF)

A conservative estimate indicates that the total direct project CO_2 emissions reduction from the deployment of an additional 1 MW of installed capacity from PV facilitated by this project is **27,540 tCO_2**, which translates into an abatement ratio of $30 of GEF funds per tCO_2 reduced. Please see below for further details.

Assumptions: (1) PV system capacity factor = 20%; (2) Useful life of solar power systems = 20 years; (3) Average emission factor from diesel generators = 0.786 tCO2/MWh

Calculations:
Annual power generation from PV systems = 1 x 0.2 x 8760 = 1,752 MWh
Annual CO2 emission reduction = 0.786 x 1,752 = 1,377 tons/year
Lifetime CO2 emission reduction = 1,377 x 20 = 27,540 tons

The total indirect emissions reductions are presented in the table below

	type	Descriptions	Targets	tCO2	UAC
1	Direct GHG emission reductions	Emission reductions achieved from project investments during the lifetime of the installations	1 MWp installed, operating during 20 years project period, 20% capacity utilization, 0.786 tCO2eq/kWh emission factor	27,541	31.3
2	Direct ***post-project*** GHG emission reductions	Emission reductions achieved from project investments in financing mechanisms (e.g. revolving funds)	Investments by GEF project are not used for setting up financing mechanism; hence no direct post-project emission reductions	0	0
3	***Consequential*** GHG emission reductions: ***bottom-up***	Emission reductions achieved by replication of project activities	Multiplication factor 1.5 (based on 3 MWp installed from committed 6,8 mUSD, 50% attributable to GEF project) applied to direct emission reductions	41,312	20.9

4	***Consequential*** GHG emission reductions: ***top-down***	Emission reductions achieved by realizing market potential	Market potential of 729,000 inhabitants with 330 kWh/cap annual demand. Average annual consumption over 10 years with 2% annual growth (10% on average) of which 60% attributable to GEF project (level 3 causality: substantial GEF contribution but modest indirect emission reductions attributed to the baseline)	113,453	7.6

KEY INDICATORS, ASSUMPTIONS AND RISKS

Indicators

Key indicators of the project's success will include:

- An off-grid law is adopted together with several decrees for its full application to ease private sector intervention;
- Adoption of an adequate tariff for off-grid projects;
- Adoption of norms and standards for off-grid;
- Up to 1 MW solar pv capacity is installed supplying electricity to 10 000 inhabitants;
- Direct CO_2 emissions avoided by: 27,540 tons CO2 eq (without addition of incremental capacity), under the assumption of a 20-year equipment projected life;
- Consequential GHG emission reductions: bottom-up 41,312 tons CO2 eq
- Consequential emission reductions: top-down approach 113,453 tons CO2 eq
- The institutions in charge of off-grid market are strengthened;
- Training of 200 experts, technicians and skilled labor in various off-grid technologies and concepts;
- 50 jobs created in the off-grid sub-sector related to administrative, accounting, communications/public relations, engineering, legal fields, etc.;.
- 500 jobs in income-generating activities created as a result of an affordable, stable and continuous electricity service.
- Lessons learned documented and distributed to potential stakeholders through publications, public awareness campaigns and project website.

Overall Assumptions & Risk

Table 4 Overall assumptions and risks

Risk	Level of Risk	Mitigation Action
Political risk Djibouti is located in a very instable part of the world: the horn of Africa. This region faces regular political instability and influx of refugees, especially in Somalia, Eritrea and Yemen. However, Djibouti is in a better shape compared to its neighbors. The country is relatively calm, and elections are held on a regular basis. One of the reasons is the strong military presence from France, China, Japan and USA, which have their base in Djibouti for Middle East related operations.	P=2 I=4	The project will work as much as possible with decentralized authorities in provinces and rural areas. The political will to support this project in these regions is strong. The impact of political threat at national level is seen more in the capital, Djibouti. The project will also build a wide coalition of partners and stakeholders whose interest in rural development will likely sustain, even in case of regime change. They include local businesses and communities, NGOs and international development agencies.

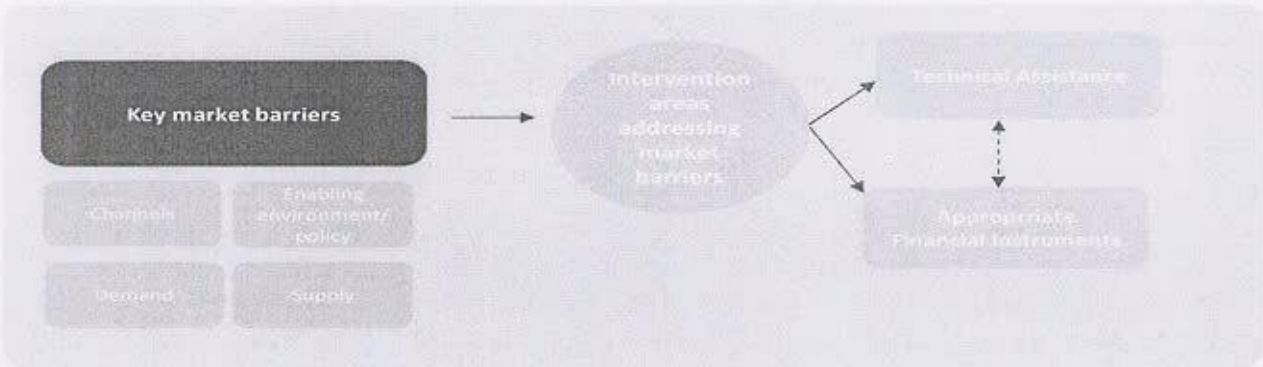
Risk	Level of Risk	Mitigation Action
However, if a sudden political instability occurs, it will certainly negatively impact on the overall investment climate and cause delays in project implementation.		
Technology risk Insufficient quality of locally-produced equipment, leading to early break-down of PV or mini-grid systems and dwindling consumer confidence in the technology.	P=2 I=2	Given the low literacy rate and the lack of technical capacity among rural communities, maintenance issues represent a significant risk for mini-grid system operations. Minor repairs have to be done by locally-trained staff to prevent equipment from being idled for long periods. Spare parts have to be standard among sites, locally manufactured if possible, readily available for transport and installed at minimal cost. The building of technical and operational capacities among rural communities will be critical to mitigate these technical risks. This will be done by providing basic technical training jobs in rural areas and sponsoring local institutions that take on maintenance tasks.
Financial risk Widespread poverty and lack of sustainable sources of income, resulting in low ability to pay for modern energy services.	P=2 I=3	The project will conduct assessments of the capacity and willingness to pay of end-users. In addition, the combination of the community business model and private sector business model will reduce the financial risk by establishing peer-pressure at community level. The role of microfinance (especially Islamic microfinance tailored to the low-income market) can also help reduce the risk. PAYGO models will be enable access to the maximum of populations at a reduced cost.
Market risk In Djibouti, RE systems will have to compete with locally available diesel alternatives. Without additional incentives, sustainable mini-grids plants may remain uncompetitive.	P=3 I=3	Introduction of financially- and socially-viable tariffs for RE-based mini-grids will be a cornerstone instrument of the proposed policy package, aimed specifically at addressing this market risk by leveling the playing field for RE against other available alternatives.
Climate risk Climate change is predicted to cause changes in, and increase the variability of, Djibouti's temperature patterns, which will pose additional challenges and risk to RE (especially PV) development.	P=1 I=3	Results of climate models for Djibouti will be incorporated in the design and selection of pilot sites. The existing and projected climatic data will be used to ensure that the chosen sites are not highly affected by irregular rain trends and are least vulnerable to projected changes in temperature or wind regimes.
OVERALL	**MODERATE**	

P = Probability on a scale from 1 (low) to 5 (high). **I** = Impact on a scale from 1 (low) to 5 (high).

Specific Market Assumptions and Risks

The proposed approach for identifying intervention areas and appropriate financing mechanisms for unlocking the off-grid market of Djibouti is as presented in the figure below

Figure 4: Strategies for unlocking the off-grid market



The table below provide an overview of the market barriers / risks and mitigation measures.

Table 5: Markets risks and mitigations

Market segment	Risks / barriers	Opportunities & Intervention Areas	Financial Instrument / Technical Assistance
Regulatory landscape and enabling environment	Low quality assurance (to avoid massive presence of low grade but cheap imported products)	- Developing / adapting / enforcing norms, standards and labelling. - Train customs services - Building up a critical mass of "quality enablers" / Installer training/ certification	Technical Assistance and grant funded support
households	- Low willingness to pay (WTP) and ability to pay (based on current energy expenditures and income). - Good awareness of solar in general, but low awareness on quality - High level of informal economy. - High level of financially excluded peoples in the rural areas	- High interest in SHs for mobile phone charging and lighting but the use of mobile money is still low. - Increasing rural customers with access to basic financial services (MFIs, Mobile Money) though provision of energy loans - Serve remote rural customers without access to basic financial services with rent schemes - Serve mobile phone owners with solar through PAYG solutions. - Provide awareness activities on determining product quality and types of products.	- Repayment/financing plan with Banks/MFIs (peri-urban mainly) - Set up rent-scheme/support companies with rent schemes (peri-urban & rural areas) - PAYG options (in peri-urban areas mainly) - Subsidy / RBF (result based finance) schemes for most remote and "not – included" customers.
SMEs and productive use	- Reliable and affordable access to electricity is a big challenge, some rely on expensive generators - Prevailing informal	- Main drivers: reduce cost of electricity (replacement of small gensets or reduce the EdD bills), increase availability (reliable, potentially hybrid).	- Loan through MFIs/Banks for those financially included, for individual systems - Facilitation/subsidy of commercial credit for solar for businesses, subsidized technical

Market segment	Risks / barriers	Opportunities & Intervention Areas	Financial Instrument / Technical Assistance
	sector (no bank account, no official incorporation or fiscal number) - High CAPEX for acquiring solar / wind systems - Lack of basic skill for O&M and replacement	- Medium to larger commercial businesses easier to target than informal small enterprises (hotels and commercial-industrial operations) that use solar systems	assistance for the sizing and costing of solar systems and technical training - Multifunctional platforms for community solutions
Institutions (school, health centers, etc.)	- Limited public funding for electrification - Limited capacity for O&M - Viable model possible for health clinics (with visitor entrance fees to maintain the systems)	- Key potential to electrify clinics in terms of impact and ease of implementation - Low electrification of public rural clinics and schools.	- Grants and technical assistance for installing and O&M systems - Fees from client's health clinics for electricity to be used for O&M
Supply	- High costs of rural distribution & further expansion - Too limited sales activity in key demand segment (poorest) - Limited access to appropriate finance, - Limited experience with local formal financial sector - Underdeveloped mobile money due to poor internet coverage	- Motivate companies to go beyond their current target areas - Support companies with market data ensuring they expand to those regions with customers that match with their (current) product range / prices - Microfinance partnerships in urban and peri-urban areas - PAYG integration and partnerships with MNOs in more rural areas	- Appropriate mix of financing support (grants, low-cost debt, " equity) - Incentive-based financing scheme motivating enterprises to reach more remote areas - Consider building up quality awareness of local retailers, to build up a more "local" (and cheaper) distribution network
Local expertise	HR and Staffing	- Training and certification of a large number of experts. Creation of a nationwide experts and technicians' database that allows the identification of certified agents, installers, technicians and managers across the country.	- Grants / TA
Finances (Formal Financial Sector & Mobile channels)	- Formal financial sector has limited understanding / experience in RE sector - Limited (risk) appetite to invest in solar market - Mobile Money is still in its infancy in rural areas	- MFIs & Banks: Basic support & training in RE / solar finance - Support mobile money providers to act as payment facilitator to integrate PAYG with existing suppliers or as distribution channel. - Consider implementing PAYG models that do not need connectivity for most	- Guarantees preferred / more appropriate than dedicated credit-lines for financial intermediaries - Technical assistance in partnership development / and financial product development

Market segment	Risks / barriers	Opportunities & Intervention Areas	Financial Instrument / Technical Assistance
		remote customers (scratch card model)	

FINANCIAL MODALITY:

The project will provide an enabling policy, capacity building, technical assistance, the provision of de-risking incentives, sustainable O&M&M models and innovative financing schemes (RBF and PAYGO) to catalyze private sector investment in the development of the off-grid market in Djibouti.

The project objective will be attained through technical assistance and facilitating third parties' investment in the off-grid sector. No loan or revolving-fund mechanisms with GEF funds are considered appropriate, and, therefore, grant-type funding consisting of down payment to enable start of activities and final payment on the achievement of the agreed results (RBF) is considered a suitable option to enable successful delivery of the project outcomes.

MAINSTREAMING GENDER:

A Gender Action Plan (GAP) is attached in the Annexes. Gender will be mainstreamed in all the activities planned by the project. To facilitate such action, a gender expert will be part of the Project Board, members of the Project Management Unit will receive training on gender mainstreaming and be supported periodically by a gender expert.

The development of the off-grid / rural electrification market is expected to be male-dominated because women are generally absent from the decision-making process of whether to acquire SHS or connection to min grid in the rural areas. Sensibilization campaign will launched to favor women voices for access to off-grid electricity. Besides, women entrepreneur will be favored for productive use. Women technicians will be equally favored in the training and capacity building program.

On the demand side, access to a stable supply of electricity will assist in creating or expanding small enterprises and this activity will target women groups and individual women entrepreneurs. Further, the project developer will be sensitized on how to respond to the different electricity needs of men and women. For instance, when consulting with the population, the project developer should ensure that women are well represented and are gathered in a setting that allows them to freely voice their opinion. In market studies, both men and women should be surveyed. In general, only heads of the household (mostly men) are asked their opinion and this does not always reflect the needs of women in the household.

The percentage of women in Djibouti working in the energy sector is meaningless and this project will endeavor to make a positive difference by empowering more women to join the off-grid sector as entrepreneurs, skilled workers and users.

SOUTH-SOUTH AND TRIANGULAR COOPERATION

The project will greatly benefit from the breakthrough of the off-grid market in East Africa. Indeed, Kenya, Ugandan, Ethiopia and Tanzania are the absolute world leaders in term of off-grid penetration due to sound policies, enabling market conditions and strategies such an RBF and PAYGO.

Djibouti does not need to reinvent the wheel. The country just needs to selected the tested policies, strategies and plans for a duplication in local conditions. The project can facilitate exchanges with Ethiopia and Kenya to transfer the required know how.

KNOWLEDGE MANAGEMENT

The project will follow seven elements that are recommended in a knowledge management approach as best practices: 1) Overview of existing lessons and best practice that inform project concept; 2) Plans to learn from relevant projects, programs, initiatives & evaluations; 3) Proposed processes to capture, assess and document info, lessons, best practice & expertise generated during implementation; 4) Proposed tools and methods for knowledge exchange, learning & collaboration; 5) Proposed knowledge outputs to be produced and shared with stakeholders; 6) Discussion on how knowledge and learning will contribute to overall project/program impact and sustainability and 7) Plans for strategic communications.

1) Overview of existing lessons and best practice that inform project concept.

The existing lessons and best practices that served for drafting the proposal are drawn from the ongoing solar mini grid projects in Djibouti but also form the remarkable solar off grid market development in surrounding countries.

Overall the solar market in Djibouti is insufficiently developed due to the weak ecosystem: policies and enabling instruments, a narrow private window and investment in this nascent market, limited technical knowledge, lack of sustainable O&M&M practices and lack of ownership the beneficiaries. All the 4 existing solar mini grids in the country suffer from poor operation and maintenance. This low number of existing mini-grid (all donor driven) is equally a testimony of the underdevelopment of this market.

On the opposite, East Africa has become the leading region for the solar off-grid market with countries such as Kenya, Uganda, Ethiopia and Tanzania paving the way with ground breaking market penetration strategies and innovative financial systems to provide clean and affordable energy to an increasing rural and peri-urban population. Some of these countries have reached a level of market maturity whereby donor money and government intervention are becoming quite redundant as the private sector has been enabled to deploy successful market penetration technologies and strategies. Some of the experience gathered from these surrounding countries can successfully be imported in Djibouti.

The underlined proposal integrates most of the best practices gathered in East Africa. Those are but not limited to: (1) designing and implementing genuine policies and regulations to remove barriers for the private sector; (2) involving a large variety of actors to enable all the technical, financial, social, operational and organisational facets to be in place; (3) derisking investment in the sector through incentives; (4) technology transfer, development of local skills and abilities in all manners; (5) strong involvement of local communities, local champions, etc to create ownership.

2) Plans to learn from relevant projects, programs, initiatives & evaluations;

a. Through output 1.4, the project (with coordination with the Government), can organise a study tour in Kenya for instance to get acquainted with the success factors underlying the

booming off-grid market, specially getting relevant information from the role of the Kenyan Government to trigger the market growth.

b. It is equally required to assess thoroughly why the mini-grid market is not taking off in Djibouti by determining also the missing ingredients in the sector.
    - What has not been done?
    - What is not in place?
    - What are the shared responsibilities of the Government institutions, the private sector and the population.

3) Proposed processes to capture, assess and document info, lessons, best practice & expertise generated during implementation;

a. Put into place processes for regular information collection and reviews to detect trends, common roots barriers and successful practices;
b. Provide feedback to policy and decision makers to enable the Improvement of the ecosystem.
c. Regular projects reviews and evaluation by independent actors

4) Proposed tools and methods for knowledge exchange, learning & collaboration;

a. Creation of a national team from different public and private institutions including representatives of the beneficiary that will oversee and monitor the different projects and programs in the sector and provide feedback and recommendation to decision makers.
b. Design standard questionnaires and fiches to collect all relevant information on project development, implementation, operation in order to monitor the performance;
c. Train all actors on the contents of the questionnaires and fiches
d. Regular follow up to collect the requested information

In terms of training and overall capacity development, the following activities are proposed (output 1.4):

a. Training of policy makers and government institutions to evaluate the needs (policy gap) and formulate appropriate policies and regulation for unlocking the off-grid market
b. Training program to develop / upgrade the technical skills for off-grid project preparation, implementation, O&M and monitoring;
c. Training of local institution on monitoring and evaluation of off-grid projects
d. Assisting local education facilities to develop curriculum related to renewable energy technologies at different level: master, engineer, technician and skilled labor
e. Positioning 2 to 3 Technical assistants specialized in off-grid regulation, tariff setting and technical norms.
f. Developing expertise for systematic best practices information collection, processing and dissemination.

5) Proposed knowledge outputs to be produced and shared with stakeholders;

a. Guidelines for communities' mobilizations and involvements; customer relations and conflict resolution procedures in case of illegal connections or theft, engagement of productive end-users, etc.
b. Guidelines and recommendations for technical oversight over plant operations and responsibility for repairing faulty equipment;

c. Practical guide to accounting and administrative and financial management of off-grid systems, billing and payment collection system;

6) **Discussion on how knowledge and learning will contribute to overall project/program impact and sustainability**

a. Promoting quality with the view of gaining the confidence of the beneficiaries and users. Discussions will be initiated with relevant government institutions to adopt specifics norms and standards to safeguard the quality of the equipment and processes through certification and labelling. The custom office and relevant institutions need to be included in the discussion to prevent fraud and entrance of inappropriate equipment in the country.
b. Used batteries and electronic waste are a real menace and can reduce strongly the sustainability of mini grid program. Discussion with relevant actors on waste collection and management need to be held in the early stage of the projects so as to find solutions for systematic waste control.
c. Appropriate tariff setting is crucial to guarantee enough returns to investors while making the electricity services affordable to the population and small businesses. Several ministries and public institutions, private sector and consumers representatives should be involved in these discussions.

7) **Plans for strategic communications.**

The plan for strategic communication will seek to (i) establish trust between actors, partners and the community; (ii) manage expectations so that beneficiaries and partners are aware about the whereabout of project to forge ownership; (iii) encourage participation and collaboration to in meaningful dialogue about the programs. Beside traditional medium as a project website and regular publications the following can be undertaken:

a. Organise periodic regional and national stakeholder dialogue workshops on the projects expected outputs and challenges,
b. Document and disseminate lessons learned and best practices to relevant regional and national partners.
c. Access global best practices share them with other local and international stakeholders and ensure incorporation into the Project planning stages.
d. Ensure programming is informed by Project audit and evaluation findings, formulating a detailed action plan for implementation of audit/evaluation recommendations.

4. PROJECT MANAGEMENT

COST EFFICIENCY AND EFFECTIVENESS:

Management cost and efficiency

Overall, the project cost efficiency and effectiveness are acceptable. The total project is estimated at USD 1,163,242 will leverage USD 6,800,000 from other technical and financial partners.
However, the main justification of the underlined project is the decreasing cost of solar and the (cost) efficiency of mini grid as compared to the grid extension in low population country such as Djibouti. Indeed, favorable product economics has been the main driver of the development of the off-grid market in East Africa.

Product economics and efficiency: the trend of falling costs and rising efficiency—which has allowed for steady reductions in the price of off-grid solar (OGS) devices—is likely to continue going forward, although at a slower pace. DC appliance efficiency is improving rapidly and is playing an increasingly important role in improving the economics and service capacity of SHS.

Figure 5: Evolution of price of OGS components - Multiple units (2010-22)

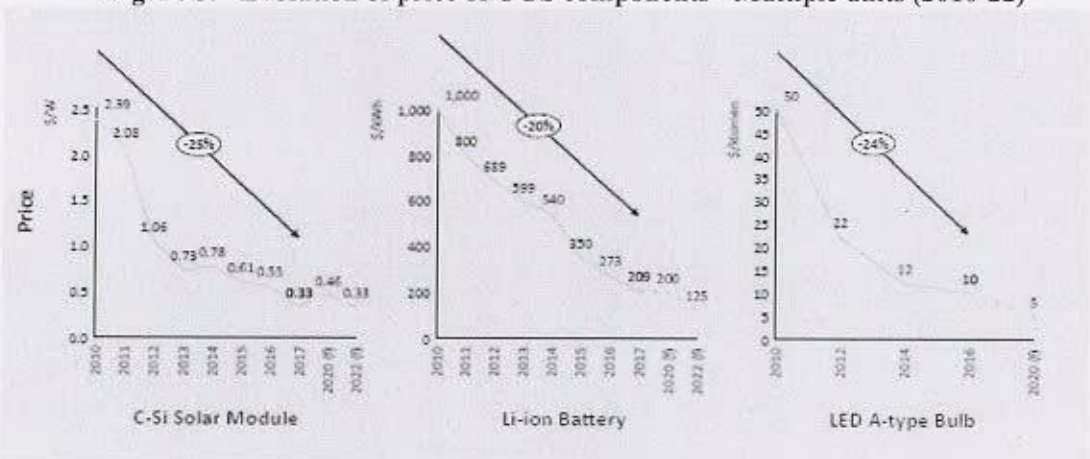
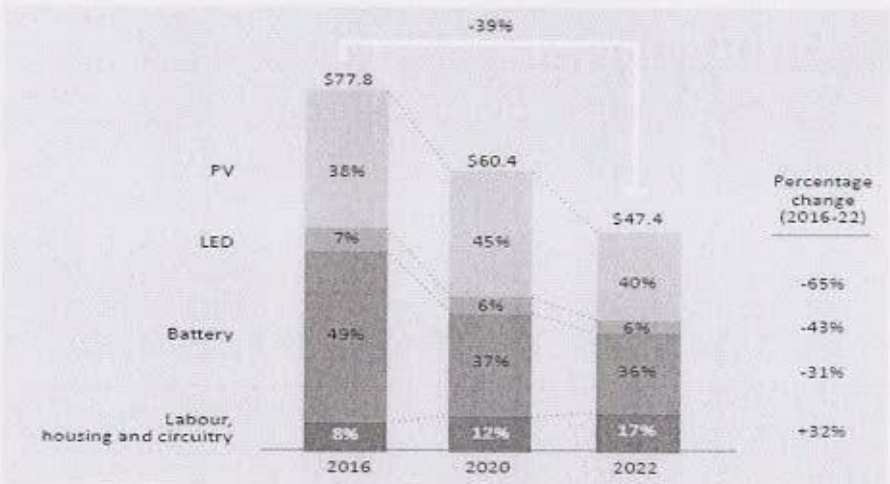


Figure 7 Decomposition and forecast for small SHS component costs (USD, 2016-2022)



The main drivers of declining OGS device prices have been improvements in the efficiency and economics of the three main components – PV panels (predominantly C-Si), LED lights, and batteries (Li-ion) – prices for which have dropped by 79%, 80% and 73% respectively between 2010 and 2016. Market positioning for each of these is reviewed below:

- Appliances: Step changes in efficiency continue to improve end-user access. The most powerful driver in improving the affordability of solar services—beyond lighting alone—is the increased efficiency of the appliance. Many DC appliances, such as pumps, refrigerators, TVs and fans have experienced rapid improvements in wattage requirements, enabling them to run on lower capacity SHS, and thereby increasing affordability for end users. Key innovations include improved brushless DC permanent magnet motors and blade design for fans; improved LEDs, efficient optical films, and panel designs that require less lighting for

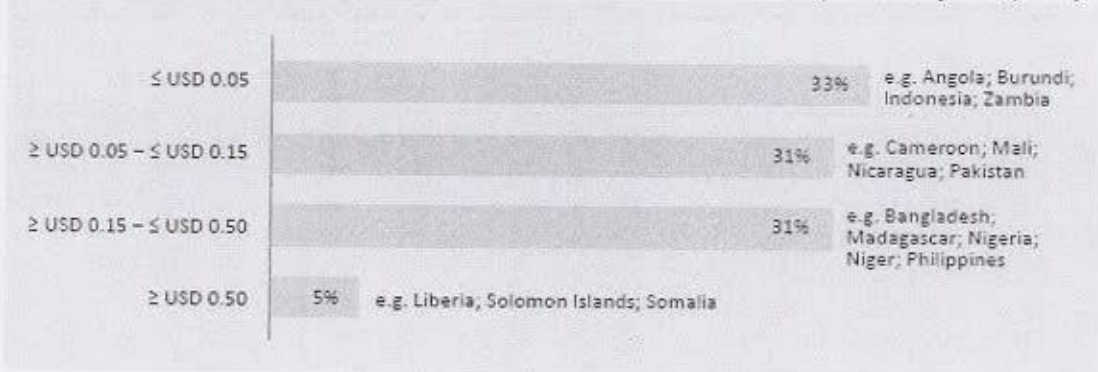
TVs; and improved insulation materials and brushless, variable DC compressors for refrigerators. Global appliance sales outside of the OGS sector are expected to continue to drive costs down.

- Panels: The price of PV panels (C-Si) dropped steeply between 2010 and 2012, driven by a 70% increase in global module production capacity between 2010 and 2011, and a drop in the price of polysilicon (from USD 80/kg to USD 30/kg) in 2011. This was followed by a period of strong demand from 2013 to 2016, exemplified by China doubling its installed capacity of solar in 2012 and 2013; in this period, prices fell, but not as precipitously as in preceding years. In 2017-18, there is likely to be a dip in prices again as leading manufacturers increase their installed capacity (over 60 GW of module production capacity was added in 2016) leading to over-supply in the market. As the market stabilizes, however, through the exit of some manufacturers as well as efforts by others to stabilize their margins, prices will be pushed up and will stabilize.

Affordability of mini grid and standalone systems

Research in 2011 found that of the 93% of urban households in Sub-Saharan Africa that lived close to the grid, only 75% had a connection. For these populations, the grid's presence increases exposure and aspiration for modern energy services, including from OGS devices.

Figure 6: Cost of subsistence electricity consumption across 55 energy-access deficit countries 86% of selected countries; USD/kWh for 30 kWh monthly consumption (2016)



In Djibouti, affordability is one of the main barriers for grid exclusion because of the prohibitive connection cost. Already, the high tariffs that are currently applied by EdD keep many households from enjoying the benefits of the electricity. Grid connection cost in rural areas is expected to be far too very high because of low population density and nomadism. In Djibouti, the electricity tariff averages USD 0.45/kWh with a social tariff reduced to USD 0.22/kWh but still too high as compared to neighboring countries.

Therefore, it is expected that mini grid and standalone can meet the required electricity for household and productive use without delay and on a cost-effective manner. Mini grid and standalone can be deployed swiftly as compared to years of preparation and implementation of interconnected systems. Besides, Djibouti will miss the required base load to maintain healthy grid system.

Compare to the high cost of grid connection, mini grid and stand are the most suitable options for electrifying the rural areas of Djibouti

PROJECT MANAGEMENT

The project will be operationalized through the use of a Project Management Unit (PMU).
Key PMU management roles include:

- Lead the development of project design including preparation of consultants' and sub-contractors' terms of reference, identification and selection of national and international sub-contractors/consultants, cost estimation, time scheduling, contracting, and reporting on project activities and budget.
- Support the activities of international/national experts, potential investors and sub-contractors and provide general administrative/financial support to project activities.

Innovativeness: The project has several distinctive features, which makes it highly innovative in the context of Djibouti. First, the project will pilot a combination of 2 business models (the community business model and the private sector business model), combining the advantages of both models to support decentralized mini-grids. It also explores the PAYG model (pay-as-you-go) as a prepayment tool for rural electrification and for the underserved urban population. Second, it will focus on identifying and supporting private sector-led RE projects (as opposed to the traditional pubic/donor-driven approach), thus maximizing long-term financial and operational sustainability. Finally, as opposed to traditional approach of delivering readily-available turn-key solutions for rural electrification, the project will work with the entire domestic value chain of solar PV, starting with design through construction and commissioning and up to operation, maintenance and management.

Sustainability: By addressing the underlying policy, financing barriers and O&M that impede the development of RE-based off-grid technologies in Djibouti, the creation of a sustainable niche for an integrated development will be realized. The financial sustainability of mini-grids and hybrid technologies will be ensured via the introduction of financially - and socially - viable tariffs. The project will also remove barriers for sustainable operating and maintenance costs, by specifically putting in place the missing elements for a sustainable O&M&M model (as described in the barrier section). Component 1 will put in place a sustainable and viable business model for the operation and maintenance of the system, Component 2 will deliver up to 1 MW to the population to ascertain the appropriateness of the adopted regulation and capacity development. Given the low literacy rate and the lack of technical capacity among rural communities, maintenance issues represent a significant risk for mini-grid system operations. Minor repairs must be done by locally-trained staff to prevent equipment from being idled for long periods. Spare parts must be standard among sites, locally manufactured if possible, readily available for transport and installed at minimal cost.

From a technical point of view, the viability of off-grid (mini grid as well stands alone) has now been demonstrated in East Africa, becoming even mainstream in providing access to peri urban and rural population., the project will strengthening the policy, institutional, legal, regulatory and operational capabilities of the key national institutions, supporting the development of the technology through a market-driven approach, developing national capabilities and disseminating information. These efforts should ensure the long-term sustainability of off-grid in Djibouti.

From a financial point of view, the project will support the involvement of local entrepreneur to develop the off-grid industry; from local assemblage of appliance (when possible) to technical and managerial capacities for, designing, financing, installing, operating, maintaining off-grid systems according to various market penetration strategies and marketing tools. This will be achieved through the provision of focused support to households willing to venture into small income-generating activities utilizing electricity, capacity development of technical personnel and

local specialized engineering workshops for manufacturing the required ancillary supporting equipment and engineering firms in the design, construction, installation, operation, maintenance and repair of the renewable off-grid-based systems. With the increase over time in renewable energy-based mini-grid installations, it is envisaged that such efforts will intensify with opportunities for job creation with additional players entering this field.

With regards to the financial support provided to project developers, a combination of down payment to enable investment and Result Based Finance (RBF) will be used. Down payment will enable local company to address part of their investments needs and trigger loans from local or international sources. RBF will ensure that supported enterprises (service providers) deliver exactly and timely the agreed upon results. The key to sustainability is a recognition services provider s will recover their full grants or subsidy or support only when the measurables outcomes are achieved, certified and recorded.

With regards to developers, the chambers of Commerce and the Development Bank of Djibouti will provide the required capacity building and support to prepare them as entrepreneurs.

The project fully endorses the human rights-based approach and will not lead to any adverse impacts on enjoyment of human rights (civil, political, economic, environmental, social or cultural) of any key or potential stakeholders, communities involved or the population at large.

The project will focus on the provision of decentralized modern energy services to the rural and peri urban population and, in the process, demonstrate the benefits that renewable energy based off-grid systems can provide to improve livelihoods. These relate to social and economic benefits in terms of a healthier environment for the population, opportunities for income-generating activities and improved natural resource management. A particular attention will be put on increasing the role of women as actors in the energy sector rather than mere beneficiaries. Women entrepreneurs will be encouraged to develop off-grid activities. Those who are engaged in the processing and conditioning of agricultural products will be the focus of the promotion of electricity for productive use.
In addition, the utilization of solar products will displace imported fossil fuel, reduce the country's GHG emissions, improve the economy and contribute to a safer environment. In doing so, capacity development for electricity consumers will emphasize the importance of best practices in energy management and the use of energy efficient devices such as turning off on lights/radios/TVs when not in use, use of LEDs for lighting, utilization of energy efficient appliances/motors, etc.

Potential for scaling-up: Djibouti's unexploited potential for solar PV means there is a substantial scope for replication and scaling-up investment in sustainable mini-grids, especially for rural electrification where almost 90% of customers are yet to be served. There are about 83 villages in the country. Those that have received donor-funded electrification programs are very few, less than 20. That means more than 60 villages are yet to be served. This represents 200,000 people that need sustainable access to energy services. Using PAYGO approaches, the urban market is an interesting segment as 45% of the population in the main cities are not connected. Among the connected one, there is opportunities to lower cost with off-grid solar systems. The policy, financial instruments and business model developed under the project, coupled with a sound awareness/outreach program, will generate interest beyond the targeted sites for replication and scaling-up by connecting the various stakeholders (rural households, small farmers, the private sector, financial institutions, technical training and local organizations) to promote the establishment of distribution channels to develop sustainable renewable energy based mini-grids for the provision of electricity services. The scaling-up will benefit not only solar PV based mini-

grids, but mini-grids with any type of renewable energy source, as some aspects of the business model will be applicable. The approaches piloted in this project can also be applied in many localities in the country and, indeed, the region.

Agreement on intellectual property rights and use of logo on the project's deliverables and disclosure of information: In order to accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF. Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy[10] and the GEF policy on public involvement[11].

[10] See http://www.undp.org/content/undp/en/home/operations/transparency/information_disclosurepolicy/
[11] See https://www.thegef.org/gef/policies_guidelines

5. PROJECT RESULTS FRAMEWORK

This project will contribute to the following Sustainable Development Goal (s):): Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all; Goal 13: Take urgent action to combat climate change and its impacts; and Goal 5: Achieve gender equality and empower all women and girls					
This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: The most vulnerable segment of the population is resilient to climate change and crises.					
This project will be linked to the following output of the UNDP Strategic Plan: Accelerating structural transformations for Sustainable Development. Signature solution 4: Promote nature - based solutions for a sustainable planet					
	Objective and Outcome Indicators	Baseline	**Mid-term Target**	**End of Project Target**	**Data Collection Methods and Risks/Assumptions**
Project Objective: Unlocking private sector investment in the sustainable off-grid sector (solar based mini-grids and SHS) for increased access to reliable and affordable electricity to peri urban and rural areas of Djibouti.	GHG Emission reduction. MWh produced.	GHG emissions in the electricity generation sector of the country was 722,399 tCO2. Government seek to cut to 40% by 2035. .	None. First 2 years are used to develop and implement the policy	Reduction 5,508 CO2 eq over 4 years; 27,540 tons CO2 eq. is avoided over 20 years. 1 MW solar capacity (mini grid and SHS) are installed .	Project's annual reports, GHG monitoring and verification reports. Project mid-term review and final evaluation reports.
					Risks: Not attracting investment – poor O&M of mini grid installations Assumptions: Continued commitment of project partners, including Government agencies and investors/developers
	Mandatory indicator 3: 10,000 direct project beneficiaries (Population to be provided with electricity access) .	The off-grid and SHS market is currently negligible	None. First 2 years are used to develop and implement the policy	10,000 persons (1,600 households) are provided with electricity	Project's annual reports. Project mid-term review and final evaluation reports.
					Risks: Not attracting investment – poor O&M of mini grid installations Assumptions: Continued commitment of project partners, including Government agencies and investors/developers
	Number of jobs created.	Currently the off-grid sector is in infancy with very	None. First 2 years are used to develop and implement the	200 technical and administrative jobs are created. 500 jobs are created through	Project's annual reports. Project mid-term review and final evaluation reports.

		little activities and jobs.	policy	productive use	Risks: Not attracting investment – poor O&M of mini grid installations Assumptions: Continued commitment of project partners, including Government agencies and investors/developers
Component 1 Policy and fir instruments, Capacity bu and knowledge managemer incentive scheme for susta off-grid technologies and de models	Output 1.1: Comprehensive but simplified regula framework to unlock the off-grid market.	Currently there is n Specific regulation for off-grid	Off-grid model is adopted to simplify the regulation.	Formulation and adoption of an sustainable off-grid l Simplified application process for licensing and concession Model contracts	Project's annual reports. Project mid-term review
					Risks: Slow political process for adopting the laws, regulations and proposed decrees Assumptions: Commitment of the Ministries of Environment and Energy to speed the process
					Risks: Slow political process for adopting the laws, regulations and proposed decrees Assumptions: Commitment of the Ministries of Environment and Energy to speed the process
	Output 1.2: Tariff setting, and design financial support.	Currently there are no specific regulatio for off-grid on these matters	Technical and financial guidelines for operating off-grid systems are available; Standards monitorin evaluation procedure off-grid systems is available.	Adoption of the norms, standards an labels (based on CEI); A standard financial model for off-grid projects are available; Methodology for tariff Setting is available. Tax and financial incentives for promoting off-grid electrification is adopted; RBF and PAYGO Schemes to ease access are Put into place.	Project's annual reports. Project mid-term review and final evaluation reports.
					Risks: Slow political process for putting the regulation in place Assumptions: Commitment of the Ministries of Environment and Energy to speed the process

	Output 1.3: Environment, gender and social inclusion	Currently there are no specific regulation for off-grid on these matters	The ESIA and gender guidelines for off-grid are elaborated	ESIA, gender and social inclusion requirements are Adopted	Project's annual reports. Project mid-term review and final evaluation reports.
					Risks: Slow process of for taking the required institutional reforms Assumptions: Commitment of the Ministries of Environment and Energy to speed the process
					Risks: Local communities not fully prepared and involved in the design and implementation of the projects – resistance to privatize the O&M. Assumptions: Willingness to privatize the O&M of the installations
	Output 1.4: Training, Capacity building programs delivered and knowledge management	Insufficient knowledge and good practice	Start within 6 months after launching the project	Training program to develop / upgrade the technical skills for off-grid project preparation, implementation, O&M and monitoring (Training of at 20 relevant stakeholders within the designated miniseries and institutions), Positioning 2 to 3 Technical assistants specialized in off-grid regulation, tariff setting and	Project's annual reports. Project mid-term review and final evaluation reports.

				technical norms and standard; Capacity developed for monitoring of project experience. Completed within 6 months of project end.	Risks: Little interest to attend the training session; lack of follow up / application afterwards Assumptions: Involved institutions can enforce the application of the delivered training programs.
Component 2: Showcasing Solar-battery mini-grids	Output 2.1 Showcasing a succ off-grid rural electrification models f setting standards for, duplication and dissemination with the electrification 100 households and productive use	No reference at this stage for successful off-grid project in Djibouti	Providing sustainable electricity (solar mini grid and standalone) to 100 households, a school, water pumping, baker and grocery	Electrifying the Moumouni village as a show case for the adopted regulation). Installation of generating capacity is set at 132,5 kWc for an average yield of 795 kWh/day	Project's annual reports. Project mid-term review and final evaluation reports.
					Risks: The proposed tariff is not attractive to private investors or too high for bargaining power of the population. Assumptions: The tariff will meet both the needs and constraints of investor and customers.
	Output 2.1.2: Replication Plan to implement outreach/promotional activities targeting both domestic and international investors	Such plan is not available currently.	The plan is adopted and completed within 24 months of project initiation.	Leveraging parallel finance through the commitment of TFP in off-grid projects Interest of investors secured to develop another 5 MW in mini grid and stands alone systems over the next 5 years following project completion. Increase availability through the development of PAYGO and other innovative instruments	Project's annual reports and final evaluation reports.

					Risks: The regulation is not enforced or fully deployed Assumptions: Enough training and pressure by governments institution to undertake the required reforms. .

6. MONITORING AND EVALUATION (M&E) PLAN

The project results as outlined in the project results framework will be monitored annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the UNDP POPP and UNDP Evaluation Policy. The UNDP Country Office will work with the relevant project stakeholders to ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. Additional mandatory GEF-specific M&E requirements (as outlined below) will be undertaken in accordance with the GEF M&E policy and other relevant GEF policies[12].

In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report. This will include the exact role of project target groups and other stakeholders in project M&E activities including the GEF Operational Focal Point and national/regional institutes assigned to undertake project monitoring. The GEF Operational Focal Point will strive to ensure consistency in the approach taken to the GEF-specific M&E requirements (notably the GEF Tracking Tools) across all GEF-financed projects in the country. This could be achieved for example by using one national institute to complete the GEF Tracking Tools for all GEF-financed projects in the country, including projects supported by other GEF Agencies.[13]

M&E Oversight and monitoring responsibilities:

Project Manager: The Project Manager is responsible for day-to-day project management and regular monitoring of project results and risks, including social and environmental risks. The Project Manager will ensure that all project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting of project results. The Project Manager will inform the Project Board, the UNDP Country Office and the UNDP-GEF RTA of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.

The Project Manager will develop annual work plans based on the multi-year work plan included in Annex, including annual output targets to support the efficient implementation of the project. The Project Manager will ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for evidence-based reporting in the GEF PIR, and that the monitoring of risks and the various plans/strategies developed to support project implementation (e.g. ESMP, gender action plan, stakeholder engagement plan etc..) occur on a regular basis.

Project Board: The Project Board will take corrective action as needed to ensure the project achieves the desired results. The Project Board will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project's final year, the Project Board will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to highlight project results and lessons learned with relevant audiences. This final review meeting will also discuss the findings outlined in the project terminal evaluation report and the management response.

Project Implementing Partner: The Implementing Partner is responsible for providing all required information and data necessary for timely, comprehensive and evidence-based project reporting,

[12] See https://www.thegef.org/gef/policies_guidelines
[13] See https://www.thegef.org/gef/gef_agencies

including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes, and is aligned with national systems so that the data used and generated by the project supports national systems.

UNDP Country Office: The UNDP Country Office will support the Project Manager as needed, including through annual supervision missions. The annual supervision missions will take place according to the schedule outlined in the annual work plan. Supervision mission reports will be circulated to the project team and Project Board within one month of the mission. The UNDP Country Office will initiate and organize key GEF M&E activities including the annual GEF PIR, the *independent mid-term review* and the independent terminal evaluation. The UNDP Country Office will also ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality.

The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the UNDP POPP. This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; that annual targets at the output level are developed, and monitored and reported using UNDP corporate systems; the regular updating of the ATLAS risk log; and, the updating of the UNDP gender marker on an annual basis based on gender mainstreaming progress reported in the GEF PIR and the UNDP ROAR. Any quality concerns flagged during these M&E activities (e.g. annual GEF PIR quality assessment ratings) must be addressed by the UNDP Country Office and the Project Manager.

The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure to support ex-post evaluations undertaken by the UNDP Independent Evaluation Office (IEO) and/or the GEF Independent Evaluation Office (IEO).

UNDP-GEF Unit: Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Directorate as needed.

Audit: The project will be audited as per UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.[14]

Additional GEF monitoring and reporting requirements:

Inception Workshop and Report: A project inception workshop will be held within two months after the project document has been signed by all relevant parties to, amongst others:
a) Re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project strategy and implementation;
b) Discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms;
c) Review the results framework and finalize the indicators, means of verification and monitoring plan;
d) Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP in M&E;
e) Update and review responsibilities for monitoring the various project plans and strategies, including the risk log; SESP, Environmental and Social Management Plan and other safeguard

[14] See guidance here: https://info.undp.org/global/popp/frm/pages/financial-management-and-execution-modalities.aspx

requirements; project grievance mechanisms; the gender strategy; the knowledge management strategy, and other relevant strategies;
f) Review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; and
g) Plan and schedule Project Board meetings and finalize the first-year annual work plan.

The Project Manager will prepare the inception report no later than one month after the inception workshop. The inception report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the Project Board.

GEF Project Implementation Report (PIR): The Project Manager, the UNDP Country Office, and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual GEF PIR covering the reporting period July (previous year) to June (current year) for each year of project implementation. The Project Manager will ensure that the indicators included in the project results framework are monitored annually in advance of the PIR submission deadline so that progress can be reported in the PIR. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR.

The PIR submitted to the GEF will be shared with the Project Board. The UNDP Country Office will coordinate the input of the GEF Operational Focal Point and other stakeholders to the PIR as appropriate. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR.

Lessons learned and knowledge generation: Results from the project will be disseminated within and beyond the project intervention area through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to the project. The project will identify, analyze and share lessons learned that might be beneficial to the design and implementation of similar projects and disseminate these lessons widely. There will be continuous information exchange between this project and other projects of similar focus in the same country, region and globally.

GEF Focal Area Tracking Tools: The following GEF Tracking Tool(s) will be used to monitor global environmental benefits:
The baseline/CEO Endorsement GEF Focal Area Tracking Tool(s) – submitted as Annex to this project document – will be updated by the Project Manager/Team (not the evaluation consultants hired to undertake the MTR or the TE) (indicate other project partner, if agreed) and shared with the mid-term review consultants and terminal evaluation consultants before the required *review*/evaluation missions take place. The updated GEF Tracking Tool(s) will be submitted to the GEF along with the completed Mid-term Review report and Terminal Evaluation report.

Terminal Evaluation (TE): An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terminal evaluation process will begin three months before operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. The Project Manager will remain on contract until the TE report and management response have been finalized. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center. As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing,

executing or advising on the project to be evaluated. The GEF Operational Focal Point and other stakeholders will be involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the Project Board. The TE report will be publicly available in English on the UNDP ERC.

The UNDP Country Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan, and will upload the final terminal evaluation report in English and the corresponding management response to the UNDP Evaluation Resource Centre (ERC). Once uploaded to the ERC, the UNDP IEO will undertake a quality assessment and validate the findings and ratings in the TE report, and rate the quality of the TE report. The UNDP IEO assessment report will be sent to the GEF IEO along with the project terminal evaluation report.

Final Report: The project's terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

Mandatory GEF M&E Requirements and M&E Budget:

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[15] (US$)		Time frame	Charged to budget line
		GEF grant	Co-financing		
Inception Workshop	UNDP Country Office	USD 11,000		Within two months of project document signature	Outcome 1/ 75700 Training, workshop, meetings
Inception Report	Project Manager	None	None	Within two weeks of inception workshop	
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually	
Risk management	Project Manager Country Office	None	None	Quarterly, annually	
Monitoring of indicators in project results framework	Project Manager	Per year: USD 4,000 (Total - 2 x USD 4,000= USD 8000)		Annually before PIR	Outcome 1 / 71300 Local consultants PMC / 71300 Local consultants

[15] Excluding project team staff time and UNDP staff time and travel expenses.

GEF Project Implementation Report (PIR)	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually	
NIM Audit as per UNDP audit policies	UNDP Country Office	Per year: USD 3,000 (Total – 3x USD 3,000 = USD 9,000)		Annually or other frequency as per UNDP Audit policies	Outcome 2/ 72100 Contractual Services-Companies
Lessons learned and knowledge generation	Project Manager			Annually	
Monitoring of environmental and social risks, and corresponding management plans as relevant	Project Manager UNDP Country Office			On-going	
Stakeholder Engagement Plan	Project Manager UNDP Country Office			On-going	
Gender Action Plan	Project Manager UNDP Country Office UNDP GEF team			On-going	
Addressing environmental and social grievances	Project Manager UNDP Country Office			On-going	
Project Board meetings	Project Board UNDP Country Office Project Manager			At minimum annually	
Supervision missions	UNDP Country Office	None[16]		Annually	
Oversight missions	UNDP-GEF team	None[16]		Troubleshooting as needed	
GEF Secretariat learning missions/site visits	UNDP Country Office and Project Manager and UNDP-GEF team	None		To be determined.	
Terminal GEF Tracking Tool to be updated by	Project Manager	USD 10,000		Before terminal evaluation mission takes place	Outcome 1 / 71300 Local consultants PMC / 71300 Local consultants
Independent Terminal Evaluation (TE) included in UNDP evaluation plan, and management response	UNDP Country Office and Project team and UNDP-GEF team	USD 30,000		At least three months before operational closure	71200 International Consultants
Translation of MTR	UNDP Country	USD 2,000		As required.	Outcome 2/

[16] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GEF Agency Fee.

and TE reports into English	Office			GEF will only accept reports in English.	72100 Contractual Services-Companies
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		*USD 70,000*			

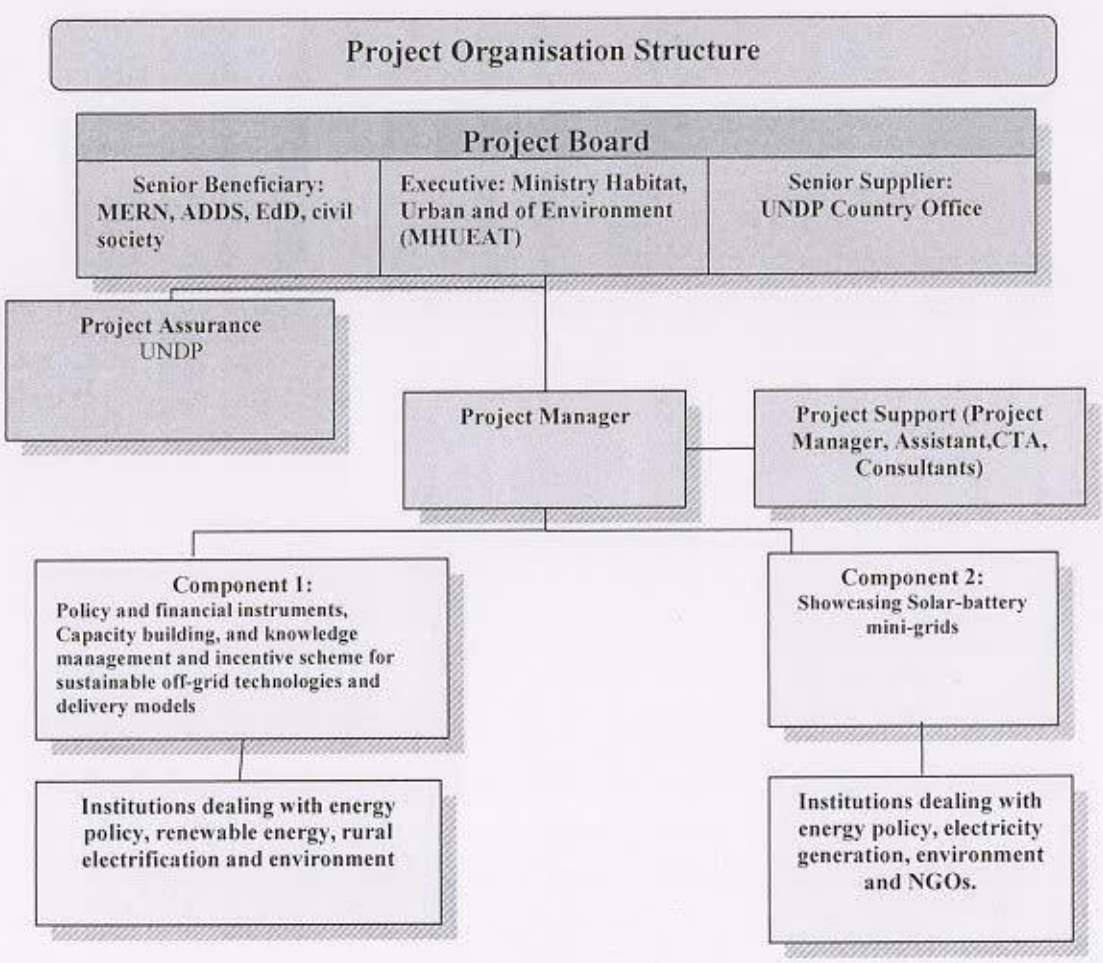
7. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

Roles and responsibilities of the project's governance mechanism: The project will be implemented following UNDP's national implementation modality, according to the Standard Basic Assistance Agreement between UNDP and the Government of Djibouti, and the Country Programme.
The **Implementing Partner** for this project is the Ministry Habitat, Urban and of Environment (as GEF focal point. The Implementing Partner is responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources. The Implementing Partner is also responsible for:

- Approving and signing the multiyear workplan;
- Approving and signing the combined delivery report at the end of the year; and,
- Signing the financial report or the funding authorization and certificate of expenditures.

Its term of overall organization, the proposed sept up is provided int eh figure below

Figure 7: The project organization structure



However, as it is the Ministry of Energy and Naturel Resources that has the mandate to elaborate and implement energy policy, the project will also establish an integrated governance platform named "Energy sector integrated management Board" that serves as a joint decision mechanism for the energy sector. It will serve as a platform to ensure harmonization of different management jurisdictions between the Ministry of Energy, EdD, ADDS and other ministries such as of Environment and Agriculture. As an exit strategy, the platform can be transformed as an independent regulator at the end of the project.

The Ministry Habitat, Urban and of Environment hosts the Project Board/Steering Committee and delegates the Ministry in charge of energy for the implementation of the project. The Ministry of Energy is better suited, technically qualified and equipped for implementing energy policies and energy projects as indicated in its mandate.

Project Board: The Project Board (also called Project Steering Committee) is responsible for making by consensus, management decisions when guidance is required by the Project Manager, including recommendations for UNDP/Implementing Partner approval of project plans and revisions, and addressing any project level grievances. In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, final decision shall rest with the UNDP Programme Manager.

Specific responsibilities of the Project Board include:

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the project manager;
- Provide guidance on new project risks, and agree on possible countermeasures and management actions to address specific risks;
- Agree on project manager's tolerances as required;
- Review the project progress, and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
- Appraise the annual project implementation report, including the quality assessment rating report; make recommendations for the workplan;
- Provide ad hoc direction and advice for exceptional situations when the project manager's tolerances are exceeded; and
- Assess and decide to proceed on project changes through appropriate revisions.

The composition of the Project Board must include the following roles:

Executive: The Executive is an individual who represents ownership of the project who will chair the Project Board. This role can be held by a representative from the Government Cooperating Agency or UNDP. The Executive is the Ministry of Environment (namely Ministry of Housing, Urban and Environment).

The Executive is ultimately responsible for the project, supported by the Senior Beneficiary and Senior Supplier. The Executive's role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The executive has to ensure that the project gives value for money, ensuring cost-conscious approach to the project, balancing the demands of beneficiary and suppler.

Specific Responsibilities: (as part of the above responsibilities for the Project Board)

- Ensure that there is a coherent project organization structure and logical set of plans;
- Set tolerances in the AWP and other plans as required for the Project Manager;
- Monitor and control the progress of the project at a strategic level;
- Ensure that risks are being tracked and mitigated as effectively as possible;
- Brief relevant stakeholders about project progress;
- Organize and chair Project Board meetings.

Senior Supplier: The Senior Supplier is an individual or group representing the interests of the parties concerned which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. The Senior Supplier role must have the authority to commit or acquire supplier resources required. If necessary, more than one person may be required for this role. Typically, the implementing partner, UNDP and/or donor(s) would be represented under this role. The Senior Suppler is: UNDP Country Office Djibouti.

Specific Responsibilities (as part of the above responsibilities for the Project Board)

- Make sure that progress towards the outputs remains consistent from the supplier perspective;
- Promote and maintain focus on the expected project output(s) from the point of view of supplier management;
- Ensure that the supplier resources required for the project are made available;
- Contribute supplier opinions on Project Board decisions on whether to implement recommendations on proposed changes;
- Arbitrate on, and ensure resolution of, any supplier priority or resource conflicts.

Senior Beneficiary: The Senior Beneficiary is an individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries. The Senior Beneficiary role is held by a representative of the government or civil society. The Senior Beneficiary is: Djibouti Social Development Agency (ADDS).

The Senior Beneficiary is responsible for validating the needs and for monitoring that the solution will meet those needs within the constraints of the project. The Senior Beneficiary role monitors progress against targets and quality criteria. This role may require more than one person to cover all the beneficiary interests. For the sake of effectiveness, the role should not be split between too many people.

Specific Responsibilities (as part of the above responsibilities for the Project Board)

- Prioritize and contribute beneficiaries' opinions on Project Board decisions on whether to implement recommendations on proposed changes;
- Specification of the Beneficiary's needs is accurate, complete and unambiguous;
- Implementation of activities at all stages is monitored to ensure that they will meet the beneficiary's needs and are progressing towards that target;
- Impact of potential changes is evaluated from the beneficiary point of view;
- Risks to the beneficiaries are frequently monitored.

Project Manager: The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Project Board within the constraints laid down by the Board. The Project Manager is responsible for day-to-day management and decision-making for the project. The Project Manager's

prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

The Implementing Partner appoints the Project Manager, who should be different from the Implementing Partner's representative in the Project Board.

Specific responsibilities include:

- Provide direction and guidance to project team(s)/ responsible party (ies);
- Liaise with the Project Board to assure the overall direction and integrity of the project;
- Identify and obtain any support and advice required for the management, planning and control of the project;
- Responsible for project administration;
- Plan the activities of the project and monitor progress against the project results framework and the approved annual workplan;
- Mobilize personnel, goods and services, training and micro-capital grants to initiative activities, including drafting terms of reference and work specifications, and overseeing all contractors' work;
- Monitor events as determined in the project monitoring schedule plan/timetable, and update the plan as required;
- Manage requests for the provision of financial resources by UNDP, through advance of funds, direct payments or reimbursement using the fund authorization and certificate of expenditures;
- Monitor financial resources and accounting to ensure the accuracy and reliability of financial reports;
- Be responsible for preparing and submitting financial reports to UNDP on a quarterly basis;
- Manage and monitor the project risks initially identified and submit new risks to the project board for consideration and decision on possible actions if required; update the status of these risks by maintaining the project risks log;
- Capture lessons learned during project implementation;
- Prepare the annual workplan for the following year; and update the Atlas Project Management module if external access is made available.
- Prepare the GEF PIR and submit the final report to the Project Board;
- Based on the GEF PIR and the Project Board review, prepare the AWP for the following year.
- Ensure the mid-term review process is undertaken as per the UNDP guidance, and submit the final MTR report to the Project Board.
- Identify follow-on actions and submit them for consideration to the Project Board;
- Ensure the terminal evaluation process is undertaken as per the UNDP guidance, and submit the final TE report to the Project Board;

Project Assurance: UNDP provides a three – tier supervision, oversight and quality assurance role – funded by the GEF agency fee – involving UNDP staff in Country Offices and at regional and headquarters levels. Project Assurance must be totally independent of the Project Management function. The quality assurance role supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. This project oversight and quality assurance role is covered by the GEF Agency.

Governance role for project target groups: The composition of the Project Board has been determined so that all target groups are represented in the highest governance structure of the project. While recognizing that not all interested target audience can be represented on the Project Board, the project makes space for

a larger number of individuals from target groups to participate in the project implementation through the four technical working groups (TWGs) that will be established for each component of the project. The TWGs will be set up to review the operational policies and progress on project outputs, provide project assurance, and provides regular reports to the Project Board. In this capacity, the TWGs will support the Project Board in monitoring functions and delivery of project outputs, ensuring that the project is on-track towards achieving the overall outcomes. The TWGs will be constituted from the list of stakeholders listed in the Project Document. Additional specific responsibilities of the TWGs will include, but are not limited to, ensuring: beneficiary needs and expectations are being met or managed; risks are being controlled; the project remains viable; internal and external communications are working; quality management procedures are properly followed; and that the Project Board decisions are followed and revisions are managed in line with procedures laid-down in the project implementation manual.

8. FINANCIAL PLANNING AND MANAGEMENT

The total cost of the project is USD 7,663,242. This is financed through a GEF grant of USD 863,242; USD 300,000 in cash co-financing to be administered by UNDP and USD 6,500,000 in parallel co-financing. UNDP, as the GEF Implementing Agency, is responsible for the execution of the GEF resources and the cash co-financing transferred to UNDP bank account only.

Parallel co-financing: The actual realization of project co-financing will be monitored during the mid-term review and terminal evaluation process and will be reported to the GEF. The planned parallel co-financing will be used as follows:

Table 6: Parallel co – financing

Co-financing source	Co-financing type	Co-financing amount USD	Planned Activities/Outputs	Risks	Risk Mitigation Measures
Gov of Djibouti	in-kind	1,000,000	Overall project support	Availability of budget	To plan it in the national budget
Gov of Djibouti	Cash	5,500,000	Investment in the Energy sector	Availability of budget	To assist the Government to timely provide the requested information related to project appraisal
Total		6,500,000			

Budget Revision and Tolerance: As per UNDP requirements outlined in the UNDP POPP, the project board will agree on a budget tolerance level for each plan under the overall annual work plan allowing the project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the Project Board. Should the following deviations occur, the Project Manager and UNDP Country Office will seek the approval of the UNDP-GEF team to ensure accurate reporting to the GEF: a) Budget re-allocations among components in the project with amounts involving 10% of the total project grant or more; b) Introduction of new budget items/or components that exceed 5% of original GEF allocation.

Any over expenditure incurred beyond the available GEF grant amount will be absorbed by non-GEF resources (e.g. UNDP TRAC or cash co-financing).

UNDP Direct Project Services as requested by Government: UNDP will provide Direct Project Services (DPS), according to UNDP policies on GEF funded projects. DPS costs are those incurred by UNDP for the provision of services that are execution driven and can be traced in full to the delivery of project inputs. Direct Project Services are over and above the project cycle management services. They relate to operational and administrative support activities carried out by UNDP. DPS include the provision of the following estimated services: i) Payments, disbursements and other financial transactions; ii) Recruitment of staff, project personnel, and consultants; iii) Procurement of services and equipment, including disposal; iv) Organization of training activities, conferences, and workshops, including fellowships; v) Travel authorization, visa requests, ticketing, and travel arrangements; vi) Shipment, custom clearance, vehicle registration, and accreditation. As is determined by the GEF Council requirements, these service costs are assigned as Project Management Cost, identified in the project budget as Direct Project Costs. Eligible Direct Project Costs should not be charged as a flat percentage. They should be calculated on the basis of estimated actual or transaction-based costs and should be charged to the direct project costs account codes: "64397 – 'Services to projects - CO staff' and 74596 – 'Services to projects - GOE for CO'.

Refund to GEF: Should a refund of unspent funds to the GEF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

Project Closure: Project closure will be conducted as per UNDP requirements outlined in the UNDP POPP.[17] On an exceptional basis only, a no-cost extension beyond the initial duration of the project will be sought from in-country UNDP colleagues and then the UNDP-GEF Executive Coordinator.

Operational completion: The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed. This includes the final clearance of the Terminal Evaluation Report (that will be available in English) and the corresponding management response, and the end-of-project review Project Board meeting. The Implementing Partner through a Project Board decision will notify the UNDP Country Office when operational closure has been completed. At this time, the relevant parties will have already agreed and confirmed in writing on the arrangements for the disposal of any equipment that is still the property of UNDP.

Transfer or disposal of assets: In consultation with the NIM Implementing Partner and other parties of the project, UNDP programme manager (UNDP Resident Representative) is responsible for deciding on the transfer or other disposal of assets. Transfer or disposal of assets is recommended to be reviewed and endorsed by the project board following UNDP rules and regulations. Assets may be transferred to the government for project activities managed by a national institution at any time during the life of a project. In all cases of transfer, a transfer document must be prepared and kept on file[18].

Financial completion: The project will be financially closed when the following conditions have been met: a) The project is operationally completed or has been cancelled; b) The Implementing Partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; d) UNDP and the Implementing Partner have certified a final Combined Delivery Report (which serves as final budget revision).

The project will be financially completed within 12 months of operational closure or after the date of cancellation. Between operational and financial closure, the implementing partner will identify and settle

[17] see https://info.undp.org/global/popp/ppm/Pages/Closing-a-Project.aspx

[18] See https://popp.undp.org/_layouts/15/WopiFrame.aspx?sourcedoc=/UNDP_POPP_DOCUMENT_LIBRARY/Public/PPM_Project%20Management_Closing.docx&action=default.

all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed closure documents including confirmation of final cumulative expenditure and unspent balance to the UNDP-GEF Unit for confirmation before the project will be financially closed in Atlas by the UNDP Country Office.

9. TOTAL BUDGET AND WORK PLAN

Award ID:		**00106644**			**Project ID(s):**	**00107272**				
Award Title:		**GEF PIMS 6202 Off-grid**								
Business Unit:		**DJI10**								
Project Title:		**GEF PIMS 6202: Promoting a better access to modern energy services through sustainable mini-grids and hybrid technologies in Djibouti**								
PIMS no.		**6202**								
Implementing Partner (Executing Agency)		**Ministry of Housing, Urban and Environment (MHUE)**								
Components	**Responsible party**	**Source of Funds**	**Donor Name**	**Atlas Budgetary Account Code**	**ATLAS Budget Description**	**Amount (USD) Year 1**	**Amount (USD) Year 2**	**Amount (USD) Year 3**	**Amount (USD) Total**	**Notes**
Component 1 Policy and financial instruments, Capacity building, and knowledge management and incentive scheme for sustainable off-grid technologies and delivery models	MHUE	62000	GEF	71200	International Consultants	50 000	50 000	50 000	150 000	1
		62000	GEF	71300	Local consultants	30 000	30 000	30 000	90 000	2
		62000	GEF	71600	Travel	8 000	8 000	8 000	24 000	3
		62000	GEF	72200	Equipment & Furniture	10 000	10 000	10 000	30 000	4
		62000	GEF	74200	Audio Visual & Print Prod Costs	5 000	10 000	10 000	25 000	5
		62000	GEF	75700	Training, workshop, meetings	25 000	25 000	25 000	75 000	6
		62000	GEF	74500	Miscellaneous	2 000	2 000	2 000	6 000	7
					Total GEF Component 1	**130 000**	**135 000**	**135 000**	**400 000**	
		4000	UNDP	72100	Contractual Services - Companies	40 000	50 000	45 000	135 000	8
					Total UNDP Component 2	**40 000**	**50 000**	**45 000**	**135 000**	
					TOTAL COMPONENT 1 (GEF+UNDP)	**170 000**	**185 000**	**180 000**	**535 000**	
Component		62000	GEF	72100	Contractual Services-	30 000	58 000	57 000	145 000	9

2 Showcasing Solar-battery mini-grids					Companies					
		62000	GEF	71600	Travel	5 000	5 000	5 000	15 000	3
		62000	GEF	72200	Equipment & Furniture	60 000	120 000	60 000	240 000	10
					Total GEF Component 2	**95 000**	**183 000**	**122 000**	**400 000**	
		4000	UNDP	72100	Contractual Services-Companies	75 000	75 000		150 000	9
					Total UNDP Component 2	**75 000**	**75 000**	**0**	**150 000**	
					TOTAL COMPONENT 2 (GEF+UNDP)	**170 000**	**258 000**	**122 000**	**550 000**	
Project Management	MHUE	62000	GEF	71300	Local consultants	12 000	12 000	12 000	36 000	11
		62000	GEF	71600	Travel	1 004	1 005	1 005	3 014	12
		62000	GEF	72200	Equipment & Furniture	1 000	500	500	2 000	13
		62000	GEF	74500	Miscellaneous	600	550	593	1 743	7
		62000	GEF	74596	Services to Projects (Direct Project Cost)	6 829	6 828	6 828	20 485	14
					Total GEF Project Management	**21 433**	**20 883**	**20 926**	**63 242**	
		4000	UNDP	71400	Contractual Services - Individuals	5 000	5 000	5 000	15 000	11
					Total UNDP Project Management	**5 000**	**5 000**	**5 000**	**15 000**	
					Total Project Management (GEF+UNDP)	**26 433**	**25 883**	**25 926**	**78 242**	
					Total GEF	**246 433**	**338 883**	**277 926**	**863 242**	
					Total UNDP	**120 000**	**130 000**	**50 000**	**300 000**	
					TOTAL Project	**366 433**	**468 883**	**327 926**	**1 163 242**	

Budget notes:

1	International expert: various fields - policy, regulation and RE-based mini-grids (unit rate - 500$, nr of days: 300)
2	Local consultant to support the work of international experts (unit rate - 300$, nr of days: 300)
3	International/domestic travel to project sites
4	Equipment costs cover promotion documents and equipment
5	Printing and reproduction of legal and technical documentation
6	Training, workshop, meetings related to policy design, enact and enforcement (10 sessions, $7500 per unit)

7	Insurance, bank charges, and other sundries
8	Companies hired to support policy design, enact and enforcement (unit rate $500, nr. of days: 270)
9	Companies hired to support the equipment deployments
10	Equipment for electrifying 100 household
11	Project Personnel/management related cost.
12	International/domestic travel to project sites
13	Equipment and furniture for Project Management Unit
14	Direct project costs - costs for the provision of administrative and professional financial, procurement and human resource management services to the project.

Summary of Funds:

	Amount ($)	Amount ($)	Amount ($)	Total ($)
	Year 1	Year 2	Year 3	
GEF	246 433	338 883	277 926	863 242
UNDP	120 000	130 000	50 000	300 000
Government of Djibouti - Ministry of Housing, Urban and Environment	300 000	400 000	300 000	1 000 000
Government of Djibouti - Ministry of Finance (through European Development Fund *	1 750 000	2 000 000	1 750 000	5 500 000
TOTAL	**2 417 000**	**2 869 000**	**2 377 242**	**7 663 242**

*co-financing letter from Government of Djibouti - Ministry of Finance indicates support of 5 000 000 Eur; exchange rate 0.909 was used for conversion to 5 500 000 Usd

10. LEGAL CONTEXT

This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Djibouti and UNDP. All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner."
This project will be implemented by [name of entity] ("Implementing Partner") in accordance with its financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. Where the financial governance of an Implementing Partner does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition, the financial governance of UNDP shall apply.

11. RISK MANAGEMENT

Government Entity (NIM) Option
Consistent with the Article III of the SBAA *[or the Supplemental Provisions to the Project Document]*, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:

a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner's obligations under this Project Document.

The Implementing Partner agrees to undertake all reasonable efforts to ensure that no UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml.

Social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).

The Implementing Partner shall: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

The Implementing Partner will take appropriate steps to prevent misuse of funds, fraud or corruption, by its officials, consultants, responsible parties, subcontractors and sub-recipients in implementing the project or using UNDP funds. The Implementing Partner will ensure that its financial management, anti-corruption and anti-fraud policies are in place and enforced for all funding received from or through UNDP.

The requirements of the following documents, then in force at the time of signature of the Project Document, apply to the Implementing Partner: (a) UNDP Policy on Fraud and other Corrupt Practices and (b) UNDP Office of Audit and Investigations Investigation Guidelines. The Implementing Partner agrees to the requirements of the above documents, which are an integral part of this Project Document and are available online at www.undp.org.

In the event that an investigation is required, UNDP has the obligation to conduct investigations relating to any aspect of UNDP projects and programmes. The Implementing Partner shall provide its full cooperation, including making available personnel, relevant documentation, and granting access to the Implementing Partner's (and its consultants', responsible parties', subcontractors' and sub-recipients') premises, for such purposes at reasonable times and on reasonable conditions as may be required for the purpose of an investigation. Should there be a limitation in meeting this obligation, UNDP shall consult with the Implementing Partner to find a solution.

The signatories to this Project Document will promptly inform one another in case of any incidence of inappropriate use of funds, or credible allegation of fraud or corruption with due confidentiality.

Where the Implementing Partner becomes aware that a UNDP project or activity, in whole or in part, is the focus of investigation for alleged fraud/corruption, the Implementing Partner will inform the UNDP Resident Representative/Head of Office, who will promptly inform UNDP's Office of Audit and Investigations (OAI). The Implementing Partner shall provide regular updates to the head of UNDP in the country and OAI of the status of, and actions relating to, such investigation.

UNDP shall be entitled to a refund from the Implementing Partner of any funds provided that have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document. Such amount may be deducted by UNDP from any payment due to the Implementing Partner under this or any other agreement.

Where such funds have not been refunded to UNDP, the Implementing Partner agrees that donors to UNDP (including the Government) whose funding is the source, in whole or in part, of the funds for the activities under this Project Document, may seek recourse to the Implementing Partner for the recovery of any funds determined by UNDP to have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document.

Note: The term "Project Document" as used in this clause shall be deemed to include any relevant subsidiary agreement further to the Project Document, including those with responsible parties, subcontractors and sub-recipients.

Each contract issued by the Implementing Partner in connection with this Project Document shall include a provision representing that no fees, gratuities, rebates, gifts, commissions or other payments, other than

those shown in the proposal, have been given, received, or promised in connection with the selection process or in contract execution, and that the recipient of funds from the Implementing Partner shall cooperate with any and all investigations and post-payment audits.

Should UNDP refer to the relevant national authorities for appropriate legal action any alleged wrongdoing relating to the project, the Government will ensure that the relevant national authorities shall actively investigate the same and take appropriate legal action against all individuals found to have participated in the wrongdoing, recover and return any recovered funds to UNDP.

The Implementing Partner shall ensure that all of its obligations set forth under this section entitled "Risk Management" are passed on to each responsible party, subcontractor and sub-recipient and that all the clauses under this section entitled "Risk Management Standard Clauses" are included, *mutatis mutandis*, in all sub-contracts or sub-agreements entered into further to this Project Document.

12. MANDATORY ANNEXES

A. Multiyear Workplan
B. GEF Tracking Tool at baseline (provided separately)
C. Overview of technical consultancies/subcontracts
D. Terms of Reference for Project Board, Project Manager, Chief Technical Advisor and other positions as appropriate
E. UNDP Social and Environmental and Social Screening Template (SESP) (provided separately)
F. Stakeholder Engagement Plan (provided separately)
G. Gender Analysis and Action Plan (provided separately)
H. UNDP Risk Log
I. Results of the capacity assessment of the project implementing partner and HACT micro assessment (BY UNDP OFFICE DJIBOUTI)
J. Co-financing letters (provided separately)
K. LOA with the government for the provision of support services (provided separately)
L. Endorsement of the Request for Provision of Project Support Services under National Execution (provided separately)
M. Partner Capacity Assessment Tool (provided separately)

Annex A: Multi Year Work Plan

Output	Indicator	Responsible Party	Year 1				Year 2				Year 3				Year 4				Year 5			
			Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Component 1 Policy and financial instruments, Capacity building, and knowledge management and incentive scheme for sustainable off-grid technologie delivery models.																						
Output 1.1	Clear definition and roles and responsibilities among stakeholders. Sustainable off-grid law voted by the Parliament	PMU / Gov.																				
Output 1.2	Off-grid tariffs defined	PMU / Gov.																				
Output 1.3	Guidelines	PMU / Gov.																				
Output 1.4	200 persons trained 1 documentary (films) Interactive internet site 3 monthly publication of the projects results and achievement	PMU																				
Component 2: Showcasing Solar-battery mini-grids																						
Output 2.1	Setting a standard for off-grid electrification (providing power to 100 household, school and for productive use)	PMU																				
Output 2.2	Leveraging PTF and private investor for 1 MW installed capacity serving 10,000 inhabitants	PMU																				

	200 directs jobs 500 jobs (income generation)																						
Annual Implementation Review.	UNDP																						
Mid-Term Review.	UNDP																						
Terminal Evaluation.	UNDP																						

Annex B: GEF Tracking Tool at baseline (Core Indicators provided separately)

Annex C: Overview of Technical Consultancies

Consultant	Time Input	Tasks, Inputs and Outputs
For Project Management / Monitoring & Evaluation		
Local / National contracting		
Project Manager Rate: $ 50,000/ year	Full time 4 years	The Project Manager (PM), together with the CTA will be responsible for the overall management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. See the full TOR above for details.
Project Assistant $ 25,000 / year	Full time 4 years	Will support the activities of international/national experts, potential investors and sub-contractors; Provide administrative support re. typing, filing, arranging visas for international experts/sub-contractors, maintaining project's financial records, etc.; Administer project accounting as per UNDP procedures. See the full TOR above for details.
International / Regional and global contracting		
Chief Technical Advisor Rate: $30,000/Year	35 weeks over 4 years	The Chief Technical Adviser (CTA) will be responsible for providing overall technical backstopping and management support to the Project. See the full TOR above for details.
For Technical Assistance		
Outcome 1		
Local / National contracting		
Off-grid / rural electrification Policy formulation	8 weeks / over 4 years	Under close supervision of Chief Technical Advisor (CTA) and Project Manager (PM) the off-grid / rural electrification expert will work closely with the Ministry of Energy and all relevant as institutions to draft a comprehensive policy framework and related off-grid / rural electrification law. He will be in charge of all the outputs of the Outcome 1 by delivering the following: • Off-grid law proposal. • The regulatory framework including all the forms and procedure for licensing, authorization, concession • Technical norms, standards • Tarif setting structure • O&M& guidelines
Environment and social inclusion specialist	4 weeks over 4 years	• Develop the guidelines for ESIA for off-grid and rural electrification • Develop specific guideline for off-grid appliance recycling • Train relevant institutions on environmental and social inclusion monitoring and evaluation
Gender Action Plan specialist	4 weeks over 4 years	• Develop the Gender Action Plan • Train the relevant institutions on the monitoring and evaluation of GAP

Annex D: Terms of Reference

Terms of Reference for the Project Board

The Project Board (PB) will serve as the project's decision-making body. It will meet according to necessity, at least twice each year, to review project progress, approve project work plans and approve major project deliverables. The PB is responsible for providing the strategic guidance and oversight to project implementation to ensure that it meets the requirements of the approved Project Document and achieves the stated outcomes. The PB's role will include:

- Provide strategic guidance to project implementation;
- Ensure coordination between various donor funded and government funded projects and programmes;
- Ensure coordination with various government agencies and their participation in project activities;
- Approve annual project work plans and budgets, at the proposal of the Project Manager;
- Approve any major changes in project plans or programmes;
- Oversee monitoring, evaluation and reporting in line with GEF requirements;
- Ensure commitment of human resources to support project implementation, arbitrating any issues within the project;
- Negotiate solutions between the project and any parties beyond the scope of the project;
- Ensure that UNDP Social and Environmental Safeguards Policy is applied throughout project implementation; and, address related grievances as necessary.

These terms of reference will be finalized during the Project Inception Workshop.

Terms of Reference for the Technical Advisory Committee (TAC)

The TAC will provide technical advice and inputs relating to project implementation and will be chaired by the PD with support from the PM. The members of the TAC will consist of representatives from Government Ministry, UNDP, other relevant government agencies, research and educational organizations, NGOs (including WCS), technical experts and other relevant stakeholders to be agreed by the Project Board. Technical experts may be invited in to discuss specific issues. Indicative Terms of Reference are as follows. These will be reviewed by the Project Board during project inception and may be extended as necessary.

- Review planned activities and ensure that they are technically sound and that, wherever possible, there is integration and synergy between the various project components during planning and implementation;
- Promote technical coordination between institutions, where such coordination is necessary and where opportunities for synergy and sharing of lessons exist;
- Provide technical advice and guidance on specific issues concerning illegal and unsustainable wildlife trade;
- Share information on project progress and lessons learned with related stakeholders at the national level;
- The TAC or a subset of its members may be requested to undertake specific project-related tasks, such as preparing or reviewing analytical reports, strategies and action plans, etc.;
- Other tasks as indicated by the Project Board

Terms of Reference for Key Project Staff

1. Project Manager

I. Position Information	
Post title:	Project Manager (Full-time)
Office:	Project Management Unit (PMU)
Organization:	Ministry in charge of Environment
Duration of Employment:	One year with possibility of extension
Duty station:	Djibouti

II. Duties

- Lead, manage and coordinate the day-to-day activities of the PMU to be established, including administration, accounting, technical expertise, financial expertise and actual project implementation and reporting;
- Lead the development of project design including preparation of consultants' and sub-contractors' terms of reference, identification and selection of national and international sub-contractors/consultants, cost estimation, time scheduling, contracting, and reporting on project activities and budget;
- Provide support to off-grid project developers for accessing finance
- Monitor and follow-up on the status of delivery by consultants, sub-contractors, etc.
- Coordinate activities of consultants including contract management, direction and supervision of field operations, logistical support, review of technical outputs/reports, measurement/assessment of project achievements and cost control;
- Assist in the design, supervision and outreach activities of the project;
- Provide technical support to policy discussions on renewable energy technologies for rural electrification in the country;
- Act as a liaison/facilitator among the various stakeholders, including the private sector, international and national partners;
- Assume responsibility for the quality and timing of project outputs;
- Establish and maintain relationships and act as the key focal point with UNDP CO to ensure that all programming, financial and administrative matters related to the project are transparently, expediently and effectively managed, in line with established UNDP Rules and Regulations.
- Undertake other management duties that contribute to the effective implementation of the project.

III. Qualifications and Experience	
Education:	• Master's degree or equivalent in engineering, economics, business administration, finance, international development, social sciences, public administration or another relevant field.
Experience:	• Minimum of 10 years of experience in management, preferably in the energy field. • Proven ability to draft, edit and produce written proposals and results-focused reports.

	• Proven experience working with Government, civil society, international organizations or donors in combination with the knowledge of economic and financial analysis, institutional, regulatory and policy frameworks. • Good knowledge of and experience on Climate Change issues, operational modalities. • Familiarity with UNDP-GEF rules, regulations and administrative procedures would be an advantage, but not a requirement. • Prior knowledge and experience of the political, social and environmental factors and issues related to energy development and climate change mitigation in African countries; • Experience in the use of computers and office software packages (MS Word, Excel, etc.)
Language Requirements:	• Excellent English and French, both written and oral.

2. Project Assistant

I. Position Information	
Post title:	Project Assistant (Full-time)
Office:	Project Management Unit (PMU)
Organization:	Ministry of Environment
Duration of Employment:	One year with possibility of extension
Duty station:	Djibouti

II. Functions

Under the overall supervision of the Project Manager, the Project Assistant will:

- Support the activities of international/national experts, potential investors and sub-contractors;
- Provide administrative support re. typing, filing, arranging visas for international experts/sub-contractors, maintaining project's financial records, etc.;
- Administer project accounting as per UNDP procedures;
- Assist the Project Manager in organizing workshops, meetings of the Project Board and other events.
- Assist in procurement of goods and services;
- Draft letters of invitation and agendas for meetings of Project Board/workshops;
- Prepare background information, briefing materials, reports, etc., as required;
- Draft minutes of meetings, monitor/follow-up on actions required.

III. Qualifications and Experience

Education:

- Higher education in economics, management, accounting, finance or another related field.
- Specialized training in finance is desirable

Experience:

- 5 years of relevant administrative, accounting and financial experience at national and/or international level.

• Experience in the usage of computers and office software packages (MS Word, Excel, etc.). • Previous experience of working for nationally executed programme (s) funded by bilateral/multilateral organizations. • Practical experience in procurement will be an asset.
Language Requirements: • Excellent English and French, both written and oral.

Annex E: UNDP Social and Environmental Screening Procedure and plans as needed (provided separately)

Annex F: Stakeholder Engagement Plan (provided separately)

Annex G: Gender Analysis and Action Plan (provided separately)

Annex H: UNDP Risk Log

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	Enter a brief description of the risk *(In Atlas, use the Description field. **Note: This field cannot be modified after first data entry)***	When was the risk first identified? *(In Atlas, select date. Note: date cannot be modified after initial entry)*	Environmental Financial Operational Organizational Political Regulatory Strategic Other Subcategories for each risk type should be consulted to understand each risk type (see Deliverable Description for more information) *(In Atlas, select from list)*	Describe the potential effect on the project if this risk were to occur Enter probability on a scale from 1 (low) to 5 (high) P = Enter impact on a scale from 1 (low) to 5 (high) I = *(in Atlas, use the Management Response box. Check "critical" if the impact and probability is high)*	What actions have been taken/will be taken to counter this risk *(in Atlas, use the Management Response box. This field can be modified at any time. Create separate boxes as necessary using "+", for instance to record updates at different times)*	Who has been appointed to keep an eye on this risk? *(in Atlas, use the Management Response box)*	Who submitted the risk? *(In Atlas, automatically recorded)*	When was the status of the risk last checked? *(In Atlas, automatically recorded)*	e.g. dead, reducing, increasing, no change *(in Atlas, use the Management Response box)*

Annex I: Results of the capacity assessment of the project implementing partner and HACT micro assessment (provided separately)

Annex J: Co-financing letters (provided separately)

Annex K: LOA with the government for the provision of support services (provided separately)

Annex L: Endorsement of the Request for Provision of Project Support Services under National Execution (provided separately)

Partner Capacity Assessment Tool (provided separately)