Technical Assistance Facility for the Sustainable Energy for All Initiative West and Central Africa

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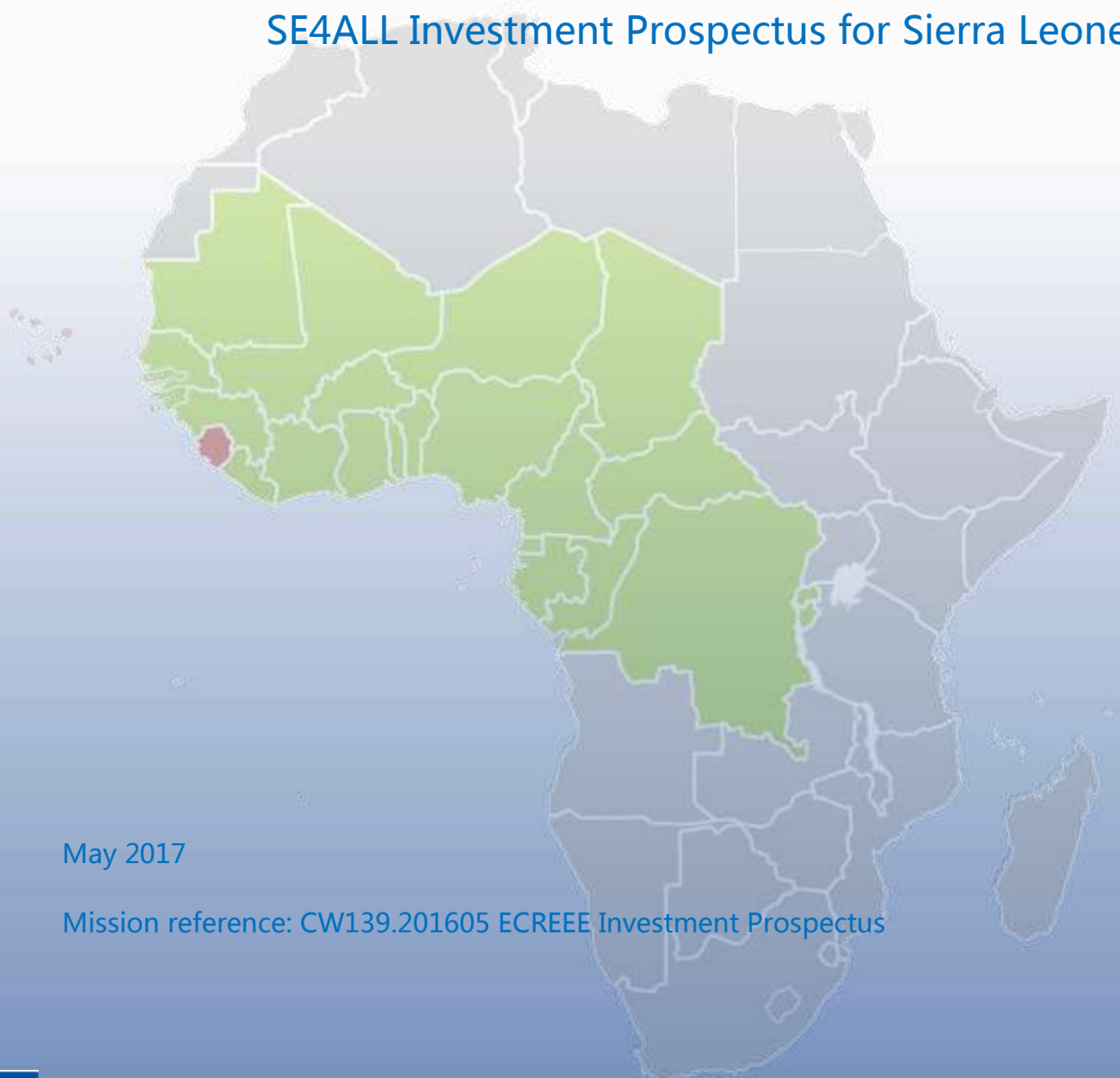
Elaboration of SE4ALL Investment Prospectuses in 8 of 15 ECOWAS member states

SE4ALL Investment Prospectus for Sierra Leone



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ECREEE has joined forces with the EU to assist member states in advancing with their Investment Prospectuses. For this reason, the "**EU's Technical Assistance Facility (TAF) for the "Sustainable Energy for all" initiative"** was mobilised (Contract EuropeAid 2013/335152 – West and Central Africa) in order to assist the countries in developing their Investment Prospectuses. This is part of a wider exercise coordinated and monitored by the SE4ALL hub in Africa that is based in Abidjan.

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ABBREVIATIONS

AA	Action Agenda
AFD	Agence Française de Développement (France)
AFDB	African Development Bank
B / Bn	Billion
CA	Contracting Authority
DEVCO	Directorate General for Development and Cooperation – EuropeAid
DFID	Department for International Development (UK)
ECOWAS	Economic Community of West African States
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency
EDF	European Development Fund
EE	Energy Efficiency
EIB	European Investment Bank
EPC	Engineering, Procurement & Construction
EREI	ECOWAS Renewable Energy Investment Initiative
EREP	ECOWAS Renewable Energy Policy
ESIA	Environmental and Social Impact Assessment
EU	European Union
EUD	European Union Delegation
EUR / €	Euro
FiT	Feed in Tariff
GIS	Geographical Information System
GIZ	Gesellschaft für Internationale Zusammenarbeit
GoSL	Government of Sierra Leone
GW / GWh	Giga Watts / Giga Watt hours
ha	Hectare
HPP	Hydro Power Plant
HV	High Voltage
IBRD	International Bank for Reconstruction and Development
ICF	International Climate Fund
IEC	International Electro-technical Commission
IFC	International Finance Corporation
IFI	International Financial Institution
IP	Investment Prospectus
IPP	Independent Power Producer
JICA	Japan International Cooperation Agency
KE	Key Expert
kW / kWh	Kilo Watt / Kilo Watt hour
LRMC	Long Run Marginal Cost
LV	Low Voltage
MCC	Millennium Challenge Corporation
MDG	Millennium Development Goal
MOU	Memorandum of Understanding
Mtoe (1)	million toe (1 million toe = 11,65 MWh)
MV	Medium Voltage
MW / MWh	Mega Watts / Mega Watt hours
NAMA	Nationally-Appropriate Mitigation

NEA	National Electricity Act
NGO	Non-Government Organization
NIP	National Indicative Programme
NKE	Non-key Expert
ODA	Official Development Assistance
OMVG	Organisation pour la mise en valeur du fleuve Gambie
OMVS	Organisation pour la mise en valeur du fleuve Sénégal
PPA	Purchase Power Agreement
PPP	Public Private Partnership
PV	Photovoltaic
RE	Renewable Energy
REA	Rural Electrification Agency
REF	Rural Electrification Fund
RrE	Rural Electrification
SE4ALL	Sustainable Energy for All
SE4ALL	Sustainable Energy for All
SHP	Small Hydro Power
SME	Small Medium sized Enterprise
TAF	Technical Assistance Facility
ToR	Terms of Reference
UEMOA	Union Economique et Monétaires des Etats de l'Afrique de L'Ouest
UNDP	United Nations Development Program
UNFCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
USD / $	United States Dollars
WAPP	West African Power Pool
WB	World Bank
HIA	High Impact Action

ECHANGE RATES

Name of national currency:	Sierra Leonean Leone (SLL)
Exchange rate US Dollar:	1 US Dollar = 7575 Sierra Leonean Leone
Exchange rate Euro:	1 euro = 7800 Sierra Leonean Leones
Date:	May 2017

1 EXECUTIVE SUMMARY

Sierra Leone's medium-term economic outlook is positive. The IMF projects medium-term growth to gradually pick up to around 6.5% by 2020 from 4.3% in 2016. Sierra Leone has significant indigenous renewable energy resources, such as solar, hydro and biomass. There is strong political will to develop energy infrastructure. The Government has good working relationships with its development partners and the grid extension initiatives supported by the West Africa Power Pool (WAPP) provide a firm basis for the development of the electricity sector.

Electricity consumption in the country has grown substantially between 2006 and 2013, from 16,168 GWh to 47,112 GWh. Economic expansion in mining, agriculture and other industries is also accelerating demand growth. The project focus of the President's Recovery Plan (PRP) means that the implementation plan for achieving the renewable energy generation and rural energy priorities of the PRP will, *de facto*, be the implementation plan for SE4ALL.

The SE4All Action Agenda process, along with the National Action Plans for Renewable Energy and Energy Efficiency, was strategy-driven and holistic, with the energy access, renewable energy, and energy efficiency targets seen as interdependent. The SEALL Action Plans and Agenda (AA) adopted in 2015, serve as a natural basis for donor co-ordination and assistance and as a reference document for the private sector and civil society. It sets out the 2030 SE4ALL goals: 1) to increase access to electricity to 92%; 2) to have butane used as a cooking fuel by 25% of the households; 3) to increase the share of renewable energy-based generation to 55.8; 4) and for energy efficiency, to reduce electricity grid system losses to 9%; energy efficiency designs and methods deployed in 90% of public buildings and more than 50% of private buildings.

Notable Initiatives in the Clean Energy Space

The path to the achievement of renewable energy-powered mini-grids is clearly through the DFID-financed, UNOPS-executed initiative to install ninety energy systems – fifty solar energy systems at health facilities, and forty solar or solar hybrid-powered mini-grids in larger communities.

Likewise, the PRP's ambitious goal of 250,000 Solar Home Systems has spurred the development of numerous small for-profit solar companies and not-for-profits, such us Barefoot Women Solar Engineers, as well as the Sierra Leone Renewable Energy Association. The latter led the successful campaign for an exemption of solar imports from import duties and other taxes in the Finance Bill of 2017.

For these initiatives to bear fruit, however, additional work needs to be done to develop adequate business models for mini-grids, i.e., working with the government to find approaches to make the electricity affordable while covering operating and future investment costs. This will require continued involvement of donors and should encompass the creation of sustainable mini-grids for the recently completed Bankasoka, Makali, and Charlotte mini-hydro generators. Likewise, the nascent solar industry will need continued support of the type that it has received from Sierra Leone Opportunities for Business Action (SOBA), a DFID-funded private sector development programme that uses market systems approaches to facilitate pro-poor economic growth. if it is to make its potential contribution to the electrification of individual households in rural areas.

The Projects

The investment prospectus contains a list of projects contributing to the achievement of the SE4ALL objectives submitted by public or by private entities, for which funding is required. The financing sought can take various forms (grants, debt, and equity) depending on the type of project. All projects are consistent with the government's vision and meet criteria set out in the framework of this investment prospectus.

They are organised into 5 "pipelines": the first two pipelines are related to access to electricity (on-grid and off grid); sustainable and clean cooking (biomass energy and biogas); energy efficiency; and finally, projects contributing to improve the investment environment.

Projects expected to be implemented before 2020 are summarized in Table 1 below, presented in table 34 (section 3.2.1) and their related Project Fiches are to be found in Annex 1. Other identified projects, either still under appraisal or which have an implementation horizon beyond 2020, are listed in table 35. No project fiche has been developed for these projects considering their early stages of development.

This investment prospectus is expected to evolve and be republished on a regular basis, in order to update information on financing for the projects described in the fiches, as well as to publish additional information on listed projects which have become investment-ready.

Table 1: Summary of Project Fiches

Reference	Promoter	Project description	Total cost
			M €
Pipeline 1 : On-grid projects			
SL_P1_1	Sewa Energy Resources	Betmai Hydropower Project	95.0
SL_P1_2	Riverblade Holdings NV	Riverblade Hydropower Project	52.0
Pipeline 2: Off-grid projects			
SL_P2_1	Teleficient (SL) Ltd.	Sierra Leone Teachers Union PAYGO Rural Electrification Project (small scale solar solutions)	0.95
SL_P2_2	Wordsworth Cole and Jonathan Thomas	Bboxx – S.L. (promotion of packaged PV solutions)	1.80
Pipeline 3: Bioenergy and Clean Cooking			
SL_P3_1	Westwind Energy (SL) Limited	Manufacturing and Distribution of improved cookstoves (ICS) in Sierra Leone	0.35
SL_P3_2	Masada Waste Transformers JV (under establishment)	Turning waste into opportunity for socially inclusive growth: Unlocking the potential of biogas in Sierra Leone	28.00

2 DESCRIPTION OF THE INVESTMENT THESIS

2.1 Country and Economic Overview

2.1.1 Geographic and demographic background and impact on the energy sector

Sierra Leone is situated in West Africa, with a total land area of approximately 72,325 sq. km. Sierra Leone shares borders with the Republic of Guinea and the Republic of Liberia, The Atlantic Ocean is the western border of the country.

Figure 1: Map of Sierra Leone

The capital city of Freetown is in the western area of the country with an estimated population of 1.25 million (about 21% of the total population).

Since the 1980s, the population of Sierra Leone has undergone major changes with an accelerated rate of urbanization, 40% of the population is living in the urban areas.

Sierra Leone is divided into four regions, namely i) the **Northern** Region, made up of five district towns Kambia, Port Loko, Bombali, Tonkolili and Koinadugu; ii) the **Southern** Region, made up of four district towns Bo, Moyamba, Pujehun and Bonthe; iii) the **Eastern Region**, made up of three district towns Kenema, Kono and Kailahun; and iv) the **Western** Area, made up of the urban capital city Freetown and peri-urban towns.

Sierra Leone has a tropical climate with hot and humid weather in the June to November rainy season, and a dry December to May season. The country has an ambient temperature range of 27°C - 35°C and relative humidity varying from an average of 80% in the rainy season to about 50% in the dry season.

According to the UN classification, Sierra Leone is considered to be a **Least Developed Country** (LDC), with significant inequality in income distribution among its people. While it has substantial mineral, agricultural, and fishery resources, its economic and social infrastructures are not well developed, which hamper its economic development. Unsustainable practices in agriculture, forest exploitation and mining have led to the degradation of the ecosystem.

Energy consumption in Sierra Leone is dominated by biomass, which accounts for over 80% of the energy used. The largest

source of biomass energy is wood fuel, followed by charcoal. Imported petroleum products are the next largest source of energy for power generation and constitute approximately 13% of energy consumption.

Currently, the electricity sub-sector in Sierra Leone faces challenges, with less than 13% of the population having access to grid-based electricity in 2013. Efficiency and access are constrained by high technical losses on the transmission and distribution (T&D) network. The development and use of renewable energy from hydro, solar, biomass and other renewable energy sources has been slow. Moreover, only marginal improvement in electricity supply has occurred over the last few years and the demand for energy far exceeds supply.

The sector faces the following challenges:

- High technical losses, estimated at about 40% of the electricity generated;
- Insufficient generation capacity and the lack of infrastructures, resulting in only 13% of the population having access to electricity from the national power grid;
- High seasonal variability in hydroelectric power production;

Sierra Leone has significant indigenous renewable energy resources, such as solar, hydro and biomass. In addition, there is strong political will to develop the energy infrastructure; the Government has good working relationships with its development partners; and grid extension initiatives supported by the West Africa Power Pool (WAPP) provide a firm basis for energy sector development.

The level of energy consumption in the country has grown substantially between 2006 and 2013, from 16,168 GWh to 47,112 GWh. Economic expansion in mining, agriculture and other industries is also accelerating demand growth.

Table 2: Country geographic and demographic background

Indicator / Criteria	Value
Area (km2)	72,300
Population (million)	6,315
Population growth (%)	2.2%
Share of rural population (%)	60%
Sources: World Bank / ECOWREX	

2.1.2 National Economic Background

The economy of Sierra Leone is predominantly agricultural, which accounts for about half of the real gross domestic product (GDP). However, the share of GDP attributed to agriculture has been declining, from about 54 percent in 2009 to 41 percent in 2013, mainly due to the growing economic value of mining activities in the country during this period.

Services follow agriculture as a major component of GDP, at about 34 percent. The manufacturing sector, consisting mainly of import–substituting industries, accounts for only 2 percent of GDP. The mining sector doubled its 2010 contribution to GDP by 12 percent in 2012 (SSL, 2012), due mainly to the discovery of iron ore in the Northern region in 2011 and its subsequent exploitation. Coffee, cocoa, and fish are the country's major agricultural exports.

Figure 2: GNI per capita

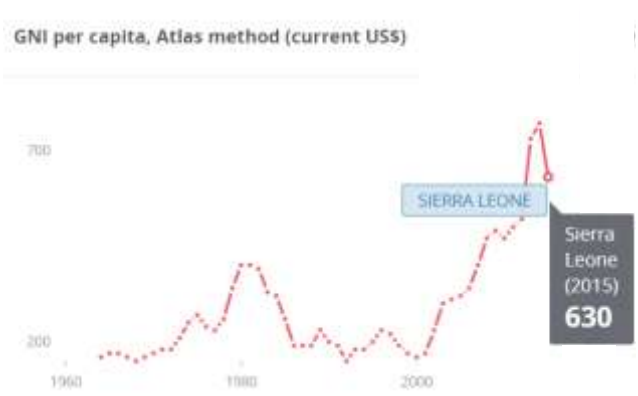
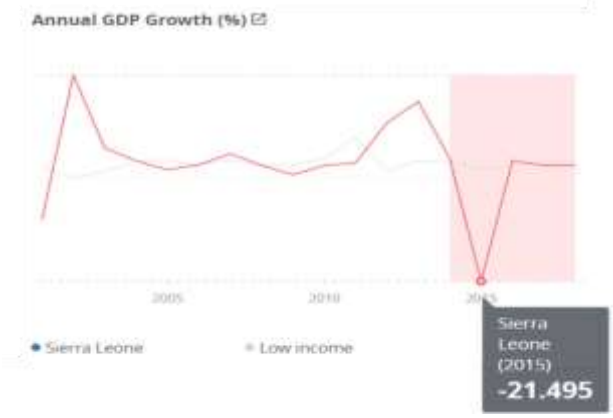


Figure 3: Annual GDP Growth



The Sierra Leone economy has struggled in the post-independence era, with its greatest decline during the 10-year civil conflict. Since the end of the conflict in 2002, several measures have been put in place to improve the economy and the quality of life of the people. These include the introduction of five-year development frameworks such as the Poverty Reduction Strategy Paper (PRSP), 2013,[1] and the Agenda for Change[2], and the Agenda for Prosperity (2012). The implementation of the Agenda for Change saw improvement in the overall economy, with emphasis in energy, infrastructure, agriculture, and social services.[3]

The economic outlook for Sierra Leone in 2013 was good, and GDP growth was expected to reach 11.3% in 2014 and an average of 8.5% for 2015-2016. The Ebola outbreak and the collapse of iron ore prices had significant impact on the economy, with real Gross Domestic Product (GDP) collapsing by -21.5% in 2015.[4] Consumer Inflation levels are high on account of exchange rate pass-through and an accommodative monetary stance. Rising from a base of 9.5% (year-on-year) in December 2015, inflation reached 10.9% in July 2016, exchange rate pressures remain unabated. The local currency (the Leone) depreciated by 20.4 % (year-on-year) to June 2016.

1 http://documents.worldbank.org/curated/en/462961468336616141/Sierra-Leone-Joint-IDA-IMF-staff-advisory-note-on-the-third-poverty-reduction-strategy

2 https://unipsil.unmissions.org/portals/unipsil/media/publications/agenda_for_change.pdf

3 Source: Sierra Leone demographic and health survey, 2013, Statistics Sierra Leone, Ministry of Health and Sanitation, Freetown, Sierra Leone.

4 Source: the World Bank, http://data,worldbank,org/country/sierra-leone

The medium-term outlook is expected to improve with the IMF projecting medium-term growth to gradually pick up to around 6.5% by 2020 from 4.3% in 2016. Inflation is projected to decline to 7.5% by 2020.

Table 3: National economic background

Indicator / Criteria	Value – Assessment - Statement
GDP (billion USD, 2014)	4.837
GDP per capita (USD, 2014)	766
GDP growth (%)	4.6%
Human development index (index/rank)	0.374 / 183
Share of population under poverty line (%)	
Governance (Mo Ibrahim index) (index/rank)	51.1/25
Sources: World Bank / ECOWREX	

2.1.3 Investment – Regulatory and Enabling Instruments

Sierra Leone is largely dependent on foreign aid, even though it has large deposits of iron ore and other minerals. The United Nations Development Program Human Development Index for 2014, which incorporates assessments of health, education, and living standards, ranks Sierra Leone 183rd of the 187 nations assessed. In addition, Sierra Leone continues to face challenges in improving its investment climate, with the World Bank ranking Sierra Leone 145th among 189 countries in its 2016 "Doing Business" report. Yet, among the subcategories in the report, Sierra Leone ranks 85th globally in protecting investors, 99th in ease of starting a business, and 152nd in ease of getting credit.

Table 4: Doing Business Sierra Leone Ranking

Topics	DB 2017 Rank	DB 2016 Rank	Change in Rank	DB 2017 DTF (% points) info_outline	DB 2016 DTF (% points)	Change in DTF (% points)
Overall	148	145	down 3	50,23	50,14	down 0,09
Starting a Business	87	99	up 12	86,48	84,73	up 1,75
Dealing with Construction Permits	132	134	up 2	62,06	61,73	up 0,33
Getting Electricity	176	176	-	33,58	34,66	down 1,08
Registering Property	163	163	-	43,47	43,38	up 0,09
Getting Credit	157	152	down 5	25,00	25,00	-
Protecting Minority Investors	87	85	down 2	53,33	53,33	-
Paying Taxes	87	84	down 3	72,63	72,86	down 0,23
Trading across Borders	169	169	-	42,07	42,07	-
Enforcing Contracts	100	99	down 1	55,92	55,92	-
Resolving Insolvency	148	149	up 1	27,76	27,69	up 0,07
Source: http://www.doingbusiness.org/data/exploreeconomies/sierra-leone/#protecting-minority-investors						

Notwithstanding the low ranking of Sierra Leone, the country offers opportunities in energy (including renewables), infrastructure, agriculture, fisheries, tourism, and natural resources. The Government is engaged in significant infrastructure development projects, and recognizes that attracting new foreign investment requires a more supportive business environment.

The Government has enacted regulatory reforms to simplify the process of starting a business and to protect the rights of minority investors. In 2016, the Millennium Challenge Corporation, a U.S.

government agency, will begin to implement a four-year, $44 million threshold program to support policy reforms, build institutional capacity, and improve governance in the water and electricity sectors.[5]

Table 5: Investment – Regulatory and Enabling Instruments

Indicator / Criteria	Value – Assessment - Statement
Governance (Mo Ibrahim index) (index/rank)	51.1, slightly above the African average
World Bank doing business index (rank)	147/189
Sources: World Bank[http://mo.ibrahim.foundation/fr/iiag/ http://mo.ibrahim.foundation/iiag/data-portal/ http://www.doingbusiness.org/data/exploreeconomies/sierra-leone/	

The investment, enabling and regulatory framework are being driven by the GoSL's "Agenda for prosperity, Road to Middle Income Status", in which energy sector development plays a significant role. In parallel, SLIEPA,[6] established in 2007, promotes investments into Sierra Leone and exports of Sierra Leone products.

SLIEPA aims to a) encourage and promote the development of agricultural production and other activities oriented towards export, b) provide exporters with marketing advisory services and assist them in developing marketing plans for entering or expanding business into foreign markets; c) identify potential investors with a view to encouraging them to invest in agriculture and other sectors of the economy, and promote, both locally and internationally, the opportunities for investment in Sierra Leone; d) collect, collate, analyse and disseminate in user-friendly and accessible formats, information about investment opportunities in the economy and priority sectors in Sierra Leone; and e) facilitate coordination and cooperation between the public and private sectors in matters relating to investments.

2.2 Energy Sector

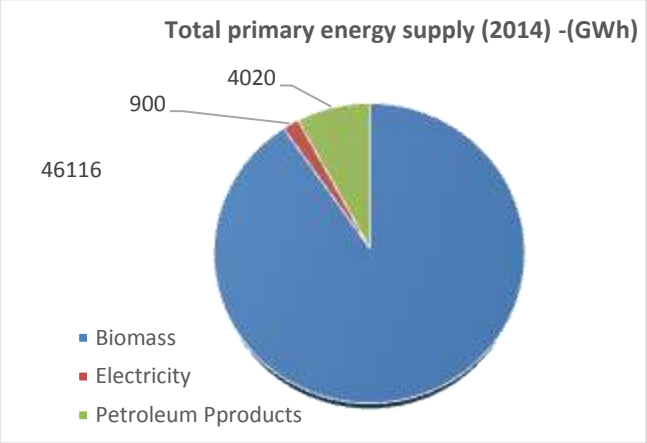
2.2.1 Characterization of the Energy Sector

In 2013, less than 13% of the population had access to grid-based electricity. Furthermore, efficiency and access are constrained by high technical losses of approximately 40% on the transmission and distribution (T&D) network. Moreover, the development and use of renewable energy from hydro, solar, biomass and other renewable sources has been slow, while the demand for energy far exceeds supply.

[5] Source: http://www.state.gov/e/eb/rls/othr/ics/investmentclimatestatements/index.htm?year=2016&dlid=254241 - wrapper

[6] Sierra Leone Investment and Export promotion Agency, http://www.investsierraleone.biz/

Figure 4: Total primary energy supply



The major challenges faced by the energy sector include[7]:

- Weak electricity transmission & distribution system with estimated losses of 40%
- Limited electricity generation capacity
- High seasonal variability of hydroelectric production

Sierra Leone has significant levels of indigenous energy resources and manifold opportunities for the productive use of energy and for the development of energy facilities.

These conditions result from the presence of strong political will, a stable political and security situation, a tropical climate conducive to solar energy production, high levels of rainfall for hydropower, the support of the West Africa Power Pool (WAPP), a large landscape of green vegetation for biomass, good working relationships between Government and development partners, and a good environment for doing business.

Table 6: Energy sector background

Indicator / Criteria	Value – Assessment - Statement
Primary energy supply (Mtoe) (2013)	3.93
Primary biomass energy (Mtoe)	3.62
Primary renewable energy (Mtoe)	0.015
Primary fossil energy (Mtoe)	0.29
Final energy total (Mtoe)	1.56
Final modern energy (Mtoe)	0.0069
Final electricity demand (TWh)	0.325
Sources: World Bank / TAF Country Fiche / ECOWREX (1 Mtoe=1 million toe = 11.65 MWh)	

2.2.2 Policy, Institutional and Regulatory Framework

The Agenda for Prosperity sets the pace for the interventions, among which energy has a significant position, required in order for Sierra Leone to become a middle-income country.[8]

7 Sierra Leone Sustainable Energy for All (SE4ALL) Country Action Agenda, 30th July, 2015

8 The Agenda for Prosperity Road To Middle Income Status, Government of Sierra Leone, http://www.sierra-leone.org/Agenda 4 Prosperity.pdf

The primary policies, strategies and plans of Sierra Leone are summarized below:[9]

- The **National Energy Policy** (NEP, 2009), which includes a renewable energy framework;
- The **National Energy Strategic Plan** (September, 2009)[10], which:
  - Lays out a strategic plan for the implementation of the Energy Policy;
  - Sets as objective to increase access to modern energy supplies in off-grid areas for reduction of poverty;
  - Prioritizes small-scale decentralized solar power supplies to meet the basic needs of lighting, refrigeration and media and information technology in rural areas, and;
  - Calls for the development of a strategy, plan and mechanisms for rural electrification.
- **National Renewable Energy Policy** of Sierra Leone (NREP), which clarifies and extends the 2009 National Energy Policy and Strategic Plan with goals, policies, and extensive measures for renewable energy.

In addition, the following policy frameworks and agreements are valid:

- SE4ALL Action Agenda (2015) – which:
  - Sets objectives and strategies on access, energy efficiency and renewable energy generating capacity
  - Identifies $2 billion financing requirement – E120m/year - E40-60m/year for access.
- **Economic Community of West African States** (ECOWAS) initiatives (2012 onward), including:
  - The **ECOWAS Renewable Energy Policy** (EREP) and the ECOWAS **Energy Efficiency Policy** (EEEP) adopted in 2013, which include minimum targets and scenarios for renewable energy (RE) and energy efficiency (EE); the EREP has set a target of promoting 60,000 mini-grids and 2.6 million stand-alone systems across the region by 2020, at a total cost of €13.6 billion to serve 71.4 million people.
- EU Joint Declaration with Sierra Leone (May 2015), which reinforces:
  - Political ownership of energy policy by the Government of Sierra Leone, and
  - EU commitment to strengthening cooperation and support in energy,
  - EU ElectriFI and other EU mechanisms for potential technical and financial assistance.

INSTITUTIONAL ARRANGEMENT

The **Ministry of Energy (MoE)** is the custodian of the energy sector in Sierra Leone with the mandate to chart out policies and coordinate their implementation.[11] Traditionally, the MoE has dealt mainly with issues related to electricity. In recent years, MoE has extended its focus to other sources of energy. The MoE has produced a national energy policy to accompany the national energy strategic plan.

Other institutions involved in the energy sector are the **Ministry of Agriculture, Forestry and Food Security (MAFFS),**[12] which has a key role in matters related to bioenergy and crop-related energy issues. Petroleum marketing and sales are handled by the **Ministry of Trade and Industry (MTI)**[13] through the Petroleum Unit (PU). The **Ministry of Finance and Economic Development (MoFED)**[14] also plays a supportive role in fiscal matters. In addition, the **Office of the President** has appointed

9 Source: Ministry of Energy, http://www.energy.gov.sl/index.html
Sierra Leone Energy Africa Compact, Energy Africa
https://static1.,squarespace.com/static/532f79fae4b07e365baf1c64/t/5826a612e3df28280c8d80ad/1478927890453/Sierral+Leone+Policy+Compact+-+Energy+Africa+-+Final.pdf

10 http://www.ecowrex.org/system/files/repository/2009_energy_strategic_plan_-_min_ener.pdf

11 http://www.energ.gov.sl

12 http://maffs.gov.sl/

13 http://trade.gov.sl/

14 http://mofed.gov.sl/

an energy advisor, who has a coordination role and tracks implementation of cabinet decisions by the ministries.

POLICY AND REGULATORY FRAMEWORK

The **2009 Energy Policy** and the **National Electricity Act** (NEA) 2011[15] guide the energy sector in Sierra Leone. The NEA mandated unbundling and restructuring of the existing public utility company into two bodies: the Sierra Leone Electricity Generation and Transmission Company (**EGTC**) and the Electricity Distribution and Supply Authority (**EDSA**)[16].

- **EGTC** is responsible for the generation and transmission of electricity and the sale of electricity to EDSA, subject to a power purchase agreement. EGTC will develop, construct and operate new government-owned generating facilities or act as the Government's partner in public/private partnerships for the development of new generation projects as well as to develop, construct, own and operate national transmission lines.
- **EDSA** is responsible for the supply, distribution and retail sale of electricity for the entire country except in areas in which a distribution license is issued to another appropriately qualified entity. EDSA purchases electricity from EGTC and from IPPs, subject to a power purchase agreement. The implementation of the National Electricity Act 2011 is being supported by the World Bank and DFID.
- **NEA** established the **Sierra Leone Electricity and Water Regulatory Commission** (EWRC)[17] to regulate the provision of electricity and water services to consumers. EWRC is responsible for issuing licenses, promoting fair competition among public utilities and establishing electricity tariffs. The Commission has been established and operates within the Ministry of Energy.

The **National Renewable Energy Policy** of Sierra Leone (**NREP**) has been developed, approved by Cabinet and had been expected to be ratified by Parliament in 2016. NREP clarifies and extends the country's 2009 National Energy Policy, with goals, policies, and measures for solar and other forms of renewable energy. NREP fully incorporates the household solar sub-sector into the National Energy Policy, and commits the Government of Sierra Leone to support the solar sector, in general, and the household solar sector, in particular.

Aiming to enhance the use of RE, the GoSL aims to take steps to further clarify, simplify and streamline policies and regulations for other forms of on-grid and off-grid renewable energy, and to clarify the roles of responsible units of government. These will include such steps as standardization and simplification of utility-scale on-grid Power Purchase Agreements (PPAs), mini-grid concession terms, and other enabling actions.

A **National Energy Efficiency Policy** of Sierra Leone (**NEEP**) is yet to be developed, following the endorsement and validation of the National Energy Efficiency Action Plan (NEEAP) (2015), as a follow-up of the ECOWAS Energy Efficiency Policy (EEEP), which includes targets and scenarios for energy efficiency. NEEAP addresses the policy and implementing measures for efficient lighting, solar cookers, efficient buildings, energy labelling, transport and improved cook stoves.

The **Sierra Leone Finance Act of 2017** pending in the Parliament, has the following provisions:

- Permanent elimination of import duties for qualifying solar equipment
- Requirement that products meet IEC global quality standards in order to qualify for tax-free status (harmonized with IFC/World Bank Lighting Africa/Lighting Global standards).

The Government intends to add to the 2017 Finance Act, and seek ratification by Parliament of the amended Act, in order to include the following:

- Eliminate GST sales taxes on sale of quality-certified solar products;

15 http://www.energy.govsl/National%20Electricity%20Act.pdf
16 http://www.edsa.sl/
17 http://www.sierra-leone.org/Laws/2011-13.pdf

- Mandate the Ministry of Energy to establish and maintain the list of qualifying products;
- Implement tax-free status with customs and port officials to enable expedited "green lane" importation for qualifying products.

Enactment and ratification of the above measures, which had previously been temporary waivers, requiring action and leaving room for interpretation by ministries, departments and agencies (MDAs), is expected to remove ambiguity and to expedite their implementation. Currently, and until ratification of the above, importers of RE equipment have to apply for GST and import tax exemption waivers (at the Ministry of Energy and the Ministry of Finance, respectively, for each importation of RE equipment.

OTHER FUTURE/PARALLEL ACTIONS

In the absence of standards and clear guidelines for household PV products, the Government of Sierra Leone, through the Ministry of Energy will cooperate with the newly formed Renewable Energy Association of Sierra Leone (REASL) as the representative of the private sector to:

- Establish a list of products, equipment and appliances that meet IEC global quality standards, as well as reporting procedures for solar companies to receive tax-free status,
- Determine what additional steps can be taken to further reduce low quality imports and reduce or eliminate the importation of counterfeit products,
- Determine what other steps REASL can take to support quality and distinguish their members from those offering low quality products and counterfeits.

Climate change instruments - INDC

Sierra Leone has been ranked as the third most vulnerable nation after Bangladesh and Guinea Bissau to the adverse effects of climate change. The Sierra Leone National Development Plan – the Agenda for Prosperity 2013 - 2018, indicates that Sierra Leone is committed to mainstreaming inclusive green growth in her development process.

Thus, the implementation of the **Intended Nationally Determined Contribution** (INDC) will support the transition to low-emission development involving decoupling carbon emissions from economic growth through a series of measures across all economic sectors. Notwithstanding the fact that the signs of the ten-year civil war and the Ebola outbreak are still apparent, Sierra Leone recently developed and adopted its National Climate Change Policy (NCCP) (2015) and National Climate Change Strategy and Action Plan (NCCS&AP) (2015) on which the INDC is based. The INDC of Sierra Leone has three components, namely: Mitigation, Adaptation and Loss and Damage, This INDC is consistent with Sierra Leone´s green growth pathway to development[18].

ENABLING ENVIRONMENT FOR PRIVATE INVESTMENT

In 2009, the Government of Sierra Leone, through the Ministry of Trade and Industry, launched a National Private Sector Development Strategy[19]. The vision behind the Strategy consists of three main

[18] Sources: Communication to UNFCCC, https://unfccc.int/files/focus/indc_portal/application/pdf/qatar_to_zimbabwe.pdfSIERRA LEONE INDC,doc, http://www4.unfccc.int/submissions/INDC/Published%20Documents/Sierra%20Leone/1/-%20SIERRA%20LEONE%20INDC.docx Sierra Leone INDC Submission to UNFCCC Secretariat 01102015.doc, http://www4.unfccc.int/submissions/INDC/Published%20Documents/Sierra%20Leone/1/Sierra%20Leone%20INDC%20Submission%20to%20UNFCCC%20Secretariat%20%2001102015.doc) http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Sierra_Leone_-_Investing_in_Environmentally_Sound_Economic_Growth.pdf

[19] Unleashing the Talent of Our People-A vision and a promise, Private Sector Development Strategy for Sierra Leone, MoTI, http://www.value-chains.org/dyn/bds/docs/724/privatesectordevelopmentstrategyforsierraleone.pdf

themes: Investment and Enterprise, Innovation and Competitiveness, Inclusion and fairness. The five main targets of the Strategy are summarized below:

- Promoting and Supporting Entrepreneurship
- Reducing the Cost and Risk of Doing Business
- Increasing Access to Affordable Finance
- Making Markets Work Better
- Providing Adequate Infrastructure

The following legislative acts [20] are related to the Strategy above:

- **Telecommunications Act, 2015**: Aiming to terminate the monopoly enjoyed by the Sierra Leone Telecommunication Company (SIERRATEL) and liberalize the country's international gateway
- **Finance Act, 2015**, amending revenue laws, aligning them to the strategic objectives of the government, in order to stimulate the business environment and increase revenues
- **The Borrowers and Lenders Act, 2014** intended to provide a legal framework for credit agreements
- **Payment Systems Act, 2009,** providing for the establishment, operation, designation and supervision of electronic payments, clearing and settlement systems, and the rights and obligations of transacting and intermediate parties
- **Companies Act, 2009**: This act provides for the registration of companies, Provisions of this law include mandating disclosure of personal conflicts of interest by company directors and officers, requiring shareholder approval of large related-party transactions to reduce possible misuse of company assets, and providing shareholders with rights to hold directors liable for damages in a related-party transaction
- **Goods and Services Tax Act, 2009, providing for** the imposition of a broad-based tax on the consumption of goods and services in Sierra Leone
- **Bankruptcy Act, 2009:** This Act provides for declaring as bankrupt any persons who cannot pay debts of a specified amount and disqualifying them from holding certain elective and public offices or from practicing any regulated profession
- **Mines and Minerals Act, 2009,** promoting local and foreign investment in the mining sector by introducing new and improved provisions for exploration, mine development, and marketing of minerals
- **Investment and Export Promotion Agency Act, 2007**, which establishes the Sierra Leone Investment and Export Promotion Agency (SLIEPA) the country's lead agency focusing on developing policies and programs to stimulate local and export trade, improve the investment climate, encourage expansion and diversification of exports, and promote the development of small to medium enterprises
- **Business Registration Act, 2007,** Aiming to reduce company registration procedures. There are no restrictions on the amount of equity a foreign firm may own in a local business.
- **Investment Code, 2005:** The code was designed to provide more protection for companies investing in Sierra Leone and to promote production and value-added activities, The code directs government to encourage joint ventures and allow full foreign ownership, The code ensures there is no discriminatory economic or industrial strategy against foreign investors and no limit is imposed on foreign ownership or control: http://www.oecd.org/investment/countryreviews.htm.

INVESTMENT INCENTIVES

Among the incentives available to investors are:

General:

- Three-year exemption on import duties for plant, machinery and equipment,
- Reduced duty rate of three percent on the import of raw materials,
- Corporate tax rate of 30 percent,
- Goods and services tax rate of 15 percent,
- Income tax of 15 to 30 percent depending on income,
- Social security contribution of 15 percent of gross salary,
- 100 percent tax loss carry forward can be utilized in any year,
- 125 percent tax deduction on R&D and training spending,
- 125 percent tax deduction on expenses for export promotion activities,

[20] Source: http://www.state.gov/documents/organization/241947.pdf

- Three-year income tax exemption for skilled expatriate staff, where bilateral treaties permit.

Infrastructure:

- Projects in excess of USD 1,000,000 will be exempt from income taxes for the earlier of ten years from start-up or the year 2020.
- Additional incentives are also available for investments in what government considers pioneer industries, such as pharmaceuticals and solar energy[21].

Table 7: Institutional framework of the energy sector

Indicator / Criteria	Value – Assessment - Statement
Electricity/Energy regulator	Established in 2016, the Sierra Leone Electricity and Water Regulatory Commission (SLEWRC), was mandated in the National Electricity Act (2011)
Operators in the electricity sector	The Electricity Generation and Transmission Corporation (EGTC) and the Electricity Distribution and Supply Authority (EDSA)
Institution in charge of rural electrification	To date, there is no organization in Sierra Leone for rural electrification. Policy is executed through the Ministry of Energy, Rural Electrification Unit, although the position of Head of Rural Energy within the Ministry is still vacant.
Institution in charge of renewable energy	As of December, 2016, there is no institution in charge of renewable energy. Renewable Energy Policy is formulated and executed by the Ministry of Energy, Renewable Energy Unit. The Renewable Energy Association of Sierra Leone (REASL) group was formed in February, 2016 as a result of Power for All leadership, establishing a private sector partner for Government and other stakeholders.
Institution in charge of energy efficiency	There is no Institution in charge of energy efficiency, Energy Efficiency Policy is formulated and executed by the Ministry of Energy, Energy Efficiency Unit.
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*	

2.3 Energy Sector Trajectory

Current (July, 2016) the installed electricity generation capacity in Sierra Leone is 163 MW, per information from the Ministry of Energy[22] This capacity is distributed almost evenly between HFO, diesel, hydro and biomass, as illustrated in Table 8, below.

[21] **Sources**:

1. http://www.state.gov/documents/organization/241947.pdf Doing Business 2016, Measuring Regulatory Quality and Efficiency, Economy Profile 2016, Sierra Leone, World Bank Flagship Report, ISBN (electronic): 978-1-4648-0668-1, http://www.doingbusiness,org/data/exploreeconomies/sierra-leone/~/media/giawb/doing%20business/documents/profiles/country/SLE.pdf
2. Unleashing the Talent of Our People A Vision and a Promise Private Sector Development Strategy for Sierra Leone, Ministry of Trade and Industry, 2009, http://www.value-chains.org/dyn/bds/docs/724/privatesectordevelopmentstrategyforsierraleone.pdf
3. \Documents Sierra Leone\Sierra Leone Policy Compact - Energy Africa - Final,docx
4. http://www.sierra-leone.org/laws.html
5. Proposed National Generation and Transmission Programme Sierra Leone, June 2016, Ministry of Energy, Energy Planning Unit

Table 8: Installed capacity by region, by fuel source

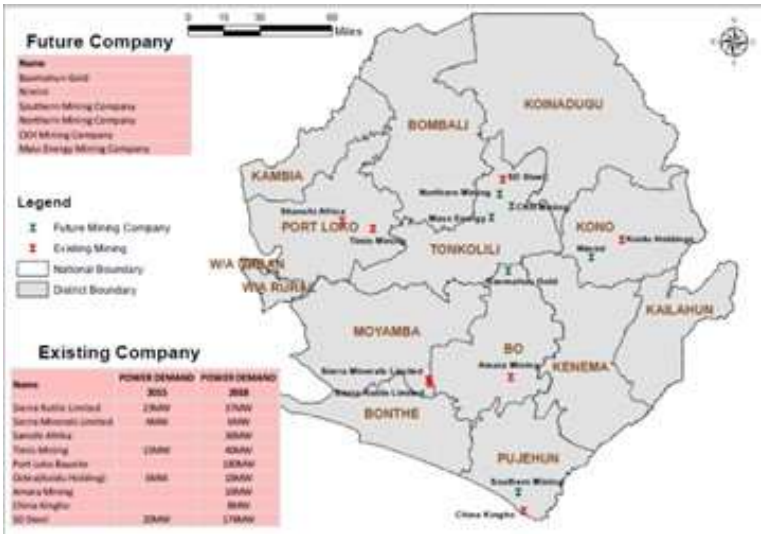
REGION	SOLAR (MW)	BIOMASS (MW)	HFO (MW)	DIESEL (MW)	HYDRO (MW)	COAL (MW)	TOTAL (MW)
W/AREA			26.5	25			51.5
NORTH		30.25	6	7.18	50.3		93.73
SOUTH				10			10
EAST				2	6		8
TOTAL (MW)	**0**	**30.25**	**32.5**	**44.18**	**56.3**	**0**	**163.23**

Of the current production capacity, approximately 70 MW is attributed to mining companies, whose demand is expected to reach more than 1,000 MW by 2020 (see table 9), distributed more or less evenly around the country as shown in Figure 5.

Table 9: Mining companies' electricity demand[23]

Name	Location	Power Demand (MW)		
		2015	2018	2020
Sierra Rutile Limited	Moyamba	23	37	40
Sierra Minerals Limited	Moyamba	4	6	10
Samshi Afrika	Port Loko		30	30
Timis Mining	Port Loko	15	40	40
Port Loko Bauxite	Port Loko		180	180
Octea (Koidu Holding)	Kono	6	18	20
Amara Mining	Bo		10	
China Kingho	Pujehun		8	350
SD Steel	Tonkolili	20	174	450
TOTAL		68	503	1,130

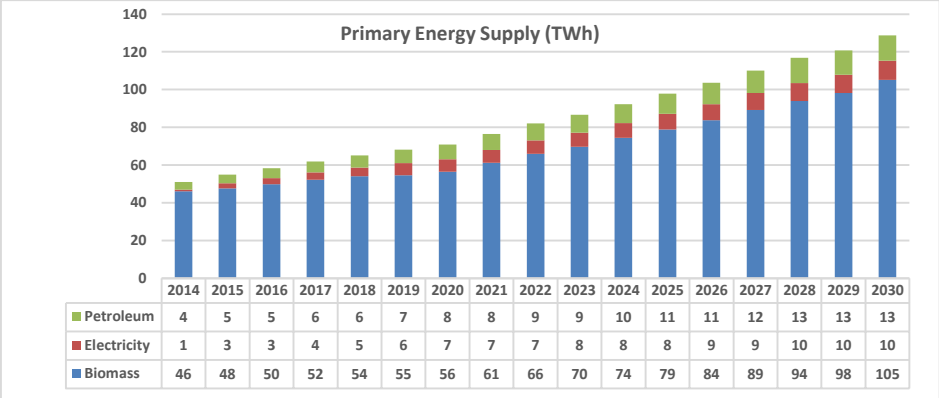
Figure 5: Map of mining companies and their electricity demand



Per the SE4ALL Action Agenda, Total Primary Energy Supply Trajectory (2014 – 2030) is given in figure 6 below, including biomass, electricity and petroleum products.

[23] PROPOSED NATIONAL GENERATION AND TRANSMISSION PROGRAMME SIERRA LEONE, JUNE 2016, Ministry of Energy, Energy Planning Unit

Figure 6: Primary Energy Supply, Sierra Leone (2014-2030)



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Petroleum	4	5	5	6	6	7	8	8	9	9	10	11	11	12	13	13	13
Electricity	1	3	3	4	5	6	7	7	7	8	8	8	9	9	10	10	10
Biomass	46	48	50	52	54	55	56	61	66	70	74	79	84	89	94	98	105

2.3.1 Electricity Sector

From a starting point of approximately 15% access to electricity, a target of 92% electrification rate has been set for year 2030, of which 55% will be grid-connected, 27% served by mini-grids and 10% served by RE-powered stand-alone systems (Table 10).

Table 10: Overview of the energy access targets and trajectories (2010 – 2030)

In %	2010	2015	2017	2020	2025	2030
Population served with electricity (%)	**8.6**	**19**	**29**	**44**	**72**	**92**
Grid-connected population (%)	8.2	15	22.25	30	42.5	55
Population connected to renewable energy powered mini-grids (%)	0.3	3	5	11	22.5	27
Population served with renewable energy powered stand-alone systems (%)	0.1	1	1.75	3	7	10

2.3.1.1 Large-scale Generation and Transmission

The SE4ALL Action Agenda projects that the projected growth in electricity demand will be met primarily through the exploitation of Sierra Leone's hydro potential.

Figure 7: Grid Expansion Plans for Sierra Leone

A number of large hydropower plants are planned such as Betmai (25MW), Mano River Union (180MW/140MW), Moyamba (15.4MW), Mange (100MW), Bumbuna II (202MW). Moreover, there are several additional sites for potential hydropower development around the country.

Transmission and distribution lines are being planned, some of which are already under construction. Figure 3 presents planned or on-going transmission lines along with large electricity production facilities.

There are currently several transmission / distribution line projects under construction, such as the new T&D connection from Bumbuna to Waterloo, the 225kV transmission line from Waterloo to Manor substation, T&D upgrades in the Western Area and Wellington Express line, the Bo Kenema T&D network rehabilitation and upgrades, and the upgrade and expansion of the T&D network in Koidu, among others.

2.3.1.2 Renewable Energy Use

Per the SE4ALL Action Agenda, the total renewable energy supply (wood fuel, biofuel, hydro, solar and wind) supply trajectory (2010 – 2030) in GWh is presented in Table 11.

Table 11: Total renewable energy supply trajectory (2010 - 2030)

	2010	2013*	2015	2020	2025	2030
Total wood fuel supply (GWh)	14.892	21.972	47.628	56.436	78.888	105.060
Wood fuel supply for firewood (GWh)	13.872	20.364	40.488	45.156	59.172	73.536
Wood fuel supply for charcoal production (GWh)	1.020	1.608	7.140	11.280	19.716	31.524
Biofuel (GWh)	0	0	72	168	294	372
Hydro power (GWh)	156	150	372	2,976	4.680	5.796
Solar (GWh)	0	18	108	384	480	528
Wind (GWh)	0	0	0	12	18	24
Total (GWh)	**15.048**	**22.140**	**48.180**	**59.888**	**84.360**	**111.780**
Source: MoE, SSL, EDSA, EGTC, MAFFS, EUEI-PDF, Tarawalli, P, Energy Consultant & Team (2014).						

2.3.1.3 Urban / Grid Connected Renewable Energy & Distribution

The total grid-connected renewable energy (hydropower) installed capacity in MW & GW for 2010, 2020 and 2030 is shown in table 12, below.

Table 12: Targets for grid-connected renewable energy

Grid connected generation Capacity (GWh)	**2010**	**2020**	**2030**
Renewable energy installed capacity (excluding medium and large hydro)	6.0	149	293
Renewable energy share in the electricity mix (%) (excluding medium and large hydro)	5.8	11.8	13.3
Large- and medium-scale hydropower installed capacity (more than 30 MW)	50	510	935
Large and medium-scale hydropower (more than 30 MW) share in the electricity mix (%)	52	40.5	42.5
Total renewable energy installed capacity (including large- and medium-scale hydro)	**56.0**	**659**	**1.229**
Total renewable energy penetration in the electricity mix (%) (including medium and large hydro)	**57.8**	**52.3**	**65.3**
Grid connected generation (GWh)	**2010**	**2020**	**2030**
Renewable energy electricity production (excluding medium and large hydro)	10.92	645.84	1.265.76

Renewable energy share of electricity consumption in % (excluding medium and large hydro)	5.6	9.1	10.2
Large- and medium-scale hydropower generation (more than 30 MW)	141.6	2.864	5.371
Large- and medium-scale hydropower generation (more than 30 MW) as share of electricity consumption (%)	72.8	40.5	43.5
Total renewable energy generation (including medium and large hydro)	**152.52**	**3,505.64**	**6,686.76**
Total renewable energy penetration in electricity consumption (%) - (including medium and large hydro)	**78.4**	**52.3**	**65.3**
Source: MoE, SSL, EDSA, EGTC, Tarawalli, P, Energy Consultant & Team (2014),			

The split between the different types of renewable energy is shown in the following Table 13.

Table 13: National 2020 and 2030 targets and trajectory (est.) of grid-connected RE (MW/GWh)

Year	**2010**	**2020**	**2030**		**2010**	**2020**	**2030**
	MW				GWh		
Small hydro (up to 30 MW)	6	42	126		10.9	223.6	680.4
Medium and large hydro (more than 30 MW)	50	510	935		141.6	2.716.2	5.049
Solar	0	73	95		0	384.7	523
Wind	0	2	5		0	10.4	27
Bioenergy	0	32	68		0	170.4	367.2
Total	**56**	**659**	**1.229**		**152.5**	**3,505.6**	**6,686.7**

2.3.2 Rural Electrification

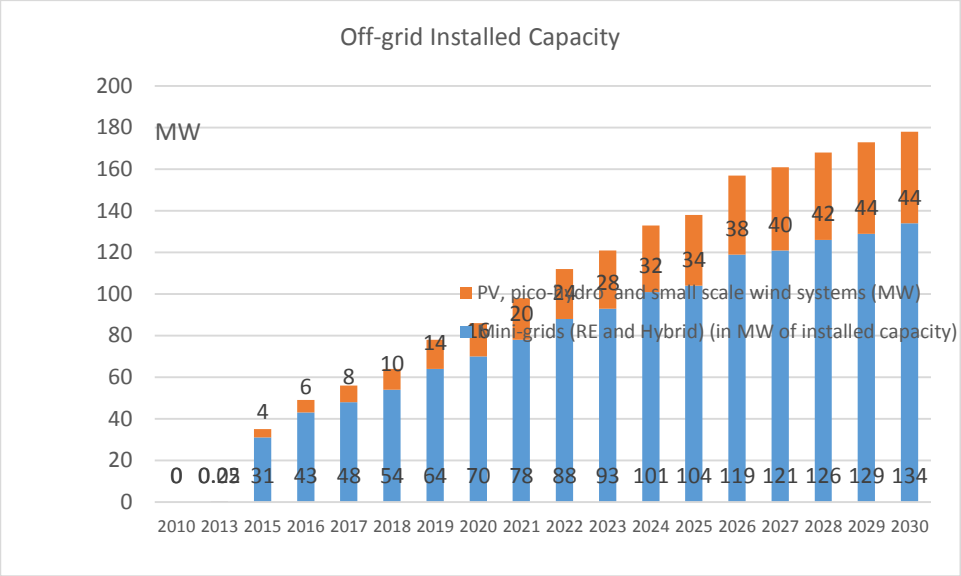
By 2030, approximately 37% of the rural population is expected to be served by renewable energy, either through mini-grids or standalone RE systems, as per table 14, below.

Table 14: Rural electrification targets

	2010	2020	2030
Share of population served by electricity services (%)	8.6	44	92
Share of population connected to the grid (%)	8.2	30	55
Share of rural population served by renewable energy and hybrid mini-grids (%)	0.4	11	27
Share of rural population served by standalone renewable energy systems (%)	0.003	3	10
Number of RE/hybrid mini-grids	2	25	65

In terms of installed capacity (MW) the following graph displays the off-grid RE trajectory.

Figure 8: 2020 and 2030 national targets and estimated trajectory for off-grid RE systems



By 2030, it is expected that some 65 RE/hybrid mini-grids will produce electricity in rural areas,

	2010	2020	2030
Number of RE/hybrid mini-grids	2	25	65

2.3.3 Petroleum Products / LPG

By 2030, 100% of the population is expected to use efficient cook stoves of which 25% utilizing LPG or other modern cooking fuels, as highlighted in Table 14 below.

2.3.4 Biomass and Traditional Energy Usage

The targets for expanding access to modern cooking systems, like the use of improved cook stoves and efficient production of charcoal for the 2010-2030 period, are also shown below, in table 15.

Table 15: Targets for expanding access to modern cooking systems (2010 – 2030)

	Unit	2010	2020	2030
Population using improved cook stoves (number of inhabitants)		**724,097**	**3,312,963**	**7,068,121**
Population using improved cook stoves (% of total population)	%	**12.60%**	**45%**	**75%**
Total charcoal production (toe)	toe	**85,000**	**247,242**	**421,803**
Charcoal production with improved carbonisation techniques (yield superior to 25%) (tonnes of charcoal)		**850**	**394.480**	**185.902**
Share of charcoal produced by efficient charcoal production techniques (%)	%	**1%**	**16%**	**46%**
Population using modern cooking fuel alternatives (LPG, biogas, solar cookers, kerosene) (number of inhabitants)		**57,468**	**1,104,321**	**2,356,040**
Population using modern fuel alternatives for cooking (e.g., LPG, biogas, solar cookers, kerosene) (%)	**%**	**1.0%**	**15.0%**	**25.0%**

Source: MoE, SSL, MAFFS, PU, EUEI-PDF 2013, Tarawalli, P, Energy Consultant & Team (2014).

2.3.5 Energy Efficiency and Demand Side Management

The GoSL plans a number of measures to increase energy efficiency in the whole energy system, thus allowing a larger part of the population to have access to energy. The targets, adopted by the GoSL, look to diminish transmission and distribution losses and to increase the use of efficient lighting, improved cooking stoves, building standards, amongst others. Table 16 presents certain targets up to 2030.

Table 16: Planned EE measures 2013-2030

SE4ALL - Energy Efficiency	2013	2020	2030
Energy efficiency % (electricity system gains)	62	85	100
Percentage of high efficiency grid-powered, non-directional household lights sold (i.e., CFLs or LEDs, with a light output superior to 40 lumens/watt) *	0,6	60	100
Percentage of high efficiency off-grid, non- directional household lights sold, (i.e., CFLs or LEDs, with a light output superior to 40 lumens/watt) *	10,3	70	100
Percentage of high efficiency public streetlights,	10,3	85	100
Forest areas under sustainable management schemes (% of national forest area)	12,2	35	70
Improved cook stoves (% of stoves sold that are considered to be ICS)	12,6	45	75
Efficient charcoal production (% share of total national production)	1	16	46
Use of modern fuel alternatives (LPG, biogas, solar cookers and others) (% of the total population)	1	15	25

2.4 SE4ALL Initiative

2.4.1 Overview

The Sustainable Energy for All (SE4ALL) initiative is a multi-stakeholder partnership between governments, the private sector and civil society. Launched by the UN Secretary-General in 2011, it has three interconnected objectives to be achieved by 2030:

- Ensure universal access to modern energy services;
- Doubling the overall rate of improvement in energy efficiency;
- Doubling the share of renewable energies in the global energy mix.

The ECOWAS Authorities mandated the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) to act as SE4ALL Focal Point in the West African region. In collaboration with its partners, ECREEE initiated the preparation and adoption of two regional policy documents, 1) ECOWAS Renewable Energy Policy 2) ECOWAS Energy Efficiency Policy – EEEP.

Between the period of 2014 and 2015, ECREEE supported ECOWAS Member States in the development of their SE4ALL National Action Agendas, including the National Action Plan for Renewable Energy (NREAP) and the National Action Plan for Energy Efficiency (NEEAP). These documents - validated by each government - provide a strategy with energy objectives and trajectories, and are supported by national policies. The national agendas SE4ALL (Action Agenda) elaborate the actions required to achieve the SE4ALL objectives in West Africa and thus make it possible to envisage the preparation of investment brochures (PI) prepared at the national level by the countries of ECOWAS on the basis of a bottom-up approach, which consists in developing a pipeline

of projects showing the effort and the timetable to bring each identified project to maturity and its "bankability".

The Country Action Agenda aims to demonstrate how the three objectives of SE4ALL can be achieved in a given country. It addresses the issues and gaps identified in the Rapid Assessment / Gap Analysis, defining and prioritizing various actions. It also clarifies the role of energy services in various sectors and how efforts in the field of access to energy, energy efficiency and renewable energy sources can contribute to the achievement of national energy development. Given the role of access to energy as a catalyst for water security, public health, education, income generation, women's empowerment, governance and sustainable development, this transparent and inter-sectoral planning must be facilitated through inter-ministerial

The SE4ALL Country Action Reference Document (CARD) foresees the following steps for the implementation of the SE4ALL Country Action:

- **Declaration of Partnership** through which the Federal Government expresses desire to participate in the SE4ALL initiative;
- **Rapid Assessment/Gap Analysis**, which describes the status quo regarding energy in the national development context, providing the political, economic, social, and environmental background for the subsequent drafting of strategic plans to promote SE4ALL in Nigeria;
- **Country Action Agenda** which is a strategy-driven and holistic document that addresses the issues and gaps identified in the respective Rapid Assessment/Gap Analysis by outlining and prioritizing various courses of action and demonstrates how the three goals of SE4ALL can be achieved; the Action Agenda has been validated;
- **Investment Prospectus**, which provides an approach to operationalizing the Country Action Agenda, in each specific sector or subsector, by identifying and developing a set of implementable programs and projects, including their investment requirements, that can be presented to potential private and public investors.

ECOWAS FRAMEWORK - ECREEE

ECREEE is the Centre for Renewable Energy and Energy Efficiency of the Economic Community of West African States (ECOWAS) based In Praia, Cape Verde. The institution was established by Regulation C / REG, 23/11/08 of the 61st session of the Council of Ministers of ECOWAS with a public mandate to promote regional markets for renewable energy and energy efficiency. It carries out its operations in 2010 with the support of the Governments of Austria and Spain and technical assistance from the United Nations Industrial Development Organization (UNIDO) among others. ECREEE is supported and legitimized by the Governments of Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo (i.e. the 15 ECOWAS member states).

The ECOWAS Energy Ministers appointed ECREEE to act as SE4ALL focal point in ECOWAS to take charge of the development and implementation of the SE4ALL initiative. ECREEE has supported ECOWAS Member States in the development of their National SE4ALL Action Agendas, National Renewable Energies Action Plans (NREAP) and National Energy Efficiency Action Plans (NEEAP). These documents provide an energy strategy and trajectories, they are validated by each Government and supported by national policies. Ultimately, the SE4ALL National Action Agenda translates national policies into a strategic path, enabling each country to meet SE4ALL targets by 2030.

Following the development of the SE4ALL Action Agenda, ECREEE, in collaboration with its partners, has developed a framework to assist ECOWAS Member States in the development of their respective SE4ALL investment prospectuses. The current phase for ECREEE, therefore, is to support Member States in developing their investment prospectus (IP) using the ECOWAS IP framework for developing a pipeline of projects identified as mature and possibly bankable.

ECREEE has received support from the European Union (EU) SE4ALL Technical Assistance Facility (TAF) to assist eight ECOWAS Member States in the preparation of their investment prospectus: Nigeria, Sierra Leone, Liberia, Cape Verde, Senegal, Togo, Benin and Côte d'Ivoire.

The AfDB's "Hub" SE4ALL for Africa, in consultation with its partners, has developed several guidelines to assist in the development of the action program and the investment prospectus. These include Action, a guide to assessing the quality of produced documents, guidelines for stakeholder consultation and a concept note on IP, The SE4ALL Hub Quality Circle evaluates the contents of the IP.

2.4.2 SE4ALL – 2030 Vision and Objectives

Sierra Leone is one of the pilot countries of the SE4All initiative, with UNDP and UNIDO co-leading implementation support. As part of the process to select potential first-movers, a mission from the EU and UNDP was received in early June 2012 to assess the government's readiness and commitment to the SE4ALL initiative.

The SE4All Action Agenda process is strategy-driven and holistic, in which the energy access, renewable energy, and energy efficiency targets are analysed together. The Action Agenda (AA) was endorsed by the Government of Sierra Leone and national stakeholders. It naturally serves as a basis for donor co-ordination and assistance on energy and as a reference document for the private sector and civil society.

The process of developing the SE4ALL Action Agenda was itself of critical importance as it defines the ultimate quality and relevance of the document. It is clear that there is national ownership of the Action Agenda and the development process was an inclusive stakeholder engagement exercise led by national authorities. The exercise brought together stakeholders from all the relevant sectors into one conversation, endorsed and coordinated at the highest political level, in order to optimize the cross-sectorial impact. An indicative outline of the Action Agenda development process is therefore included at the end of this report, The Action Agenda is concise, pragmatic and action oriented, building on existing plans and strategies. Energy access is a high priority in the Government's Agenda for Prosperity and, thus, the SE4All initiative is timely for Sierra Leone.

The Government of Sierra Leone's Agenda for Prosperity (AfP), which is also the PRSP III, sets out eight (8) pillars to guide Sierra Leone's early steps towards achieving economic recovery and energy access nationwide. The pillars are the following: Pillar 1 – Diversified economic growth, Pillar 2 – Managing natural resources, Pillar 3 – Accelerating human development, Pillar 4 – International competitiveness, Pillar 5 – Labour and employment, Pillar 6 – Social protection, Pillar 7 – Governance and public sector reform and Pillar 8 – Gender and women's empowerment (AfP, 2013).

Table 17: SE4All vision and objectives up to 2030

	2015	2020	2030
Target access rates to electricity (%) (*from AA table 3*)			
National	19%	44%	92%
Urban	15%	30%	55%
Rural	4%	14%	37%
Target access rate to butane as modern cooking fuel (%) (*from NREAP table 14*)			
National	2%	16%	25%
Urban	-	-	-
Rural	-	-	-
Target share of renewable in the generation capacity mix (%) (*from NREAP table 6*)			
Hydro	34% (*)	40% (*)	42.5 % (**)
Non hydro renewable	19% (*)	14% (*)	13.3% (**)

	2015	2020	2030
Fossil fuel	47% (*)	46% (*)	44.2% (**)
Target energy efficiency rates over 2013 baseline (%) (*from NEEAP table 3, 5, 6*)			
Electricity grid			
Total of losses in the power system, including technical and non-technical losses, in both transmission and distribution (% of power available: generation + balance of imports and exports),	45%	15%	9%
Buildings			
Percentage of new large private buildings that implement energy efficient building designs and methods	N/A	20%	50%
Percentage of new public buildings that implement energy efficient building designs and methods	N/A	55%	90%
Percentage of renovated private buildings that implement energy efficiency designs and methods	N/A	30%	60%
Percentage of renovated public buildings that implement energy efficiency designs and methods	N/A	60%	90%
Industry	**N/A**	**20%**	**50%**
Percentage of industries that implement energy efficiency measures (%)	N/A	65%	100%
Percentage of energy saving in industry (%)	N/A	21%	75%
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*			
Comments (*) Data have been sourced from the Ministry of Energy and are presented in following table Total installed capacity for 2020 is estimated to be 1754,05 MW (according to the MoE) and for 2030 approximately 2200 MW (according to the AA), (**) Based on the AA NREAP renewable energy options share in the electricity mix in (%) (excluding medium and large hydro) 13,3% Large- and medium-scale hydropower (more than 30 MW) share in the electricity mix in (%) 42,5%			

Table 18: 2016 Installed Electricity Generating Capacity

CURRENT CAPACITY INSTALLED as of June 2016								
REGION	**HYDRO (MW)**	**SOLAR (MW)**	**BIOMASS MW**	**WIND (MW)**	**DIESEL (MW)**	**HFO (MW)**	**COAL (MW)**	**TOTAL MW**
W/AREA					25	26.5		51.5
NORTH	50.3		30.25		7.18	6		93.73
SOUTH					10			10
EAST	6				2			8
TOTAL	**56.3**	**0**	**30.25**	**0**	**44.18**	**32.5**	**0**	**163.23**
***Source**: Ministry of Energy, PROPOSED NATIONAL GENERATION AND TRANSMISSION PROGRAMME SIERRA LEONE, JUNE 2016*								

Table 19: 2020 Planned Installed Electricity Generating Capacity

PLANNED INSTALLED CAPACITY in 2020								
REGION	**HYDRO (MW)**	**SOLAR (MW)**	**BIOMASS MW**	**WIND (MW)**	**DIESEL (MW)**	**HFO (MW)**	**COAL (MW)**	**TOTAL MW**
W/AREA	2.2	6 ([1])	0	0	0	333	0	341.2
NORTH	329.6	212	15.25	1	12	0	450	1,019.85
SOUTH	200	5 ([2])	0	1	5	6	0	217
EAST	166	2	0	0	2	6	0	176
TOTAL	**697.8**	**225**	**15.25**	**2**	**19**	**345**	**450**	**1,754.05**

Source: Ministry of Energy, PROPOSED NATIONAL GENERATION AND TRANSMISSION PROGRAMME SIERRA LEONE, JUNE 2016

Note: 642 MW out of the 687,8 MW concern 4 large hydroelectric plants, namely Mange(100MW), Koidu/Kono (160MW), Mano River (180MW) and Bumbuna II/Yeben (202 MW),

([1]): Kington PV Project

([2]): Newton PV Project

Table 20: Targets for grid-connected renewable energy

	2010	**2020**	**2030**
Renewable energy in MW installed capacity (excluding medium and large hydro)	6	149	293
Renewable energy share in the electricity mix (%) (excluding medium and large hydro)	5.8	11.8	13.3
Large- and medium-scale hydropower installed capacity in MW (more than 30 MW)	50	510	935
Large and medium-scale hydropower (more than 30 MW) share in the electricity mix (%)	52	40.5	42.5
Total renewable energy installed capacity in MW (including large- and medium-scale hydro)	56	659	1.229
Total renewable energy penetration in the electricity mix (%) (including medium and large hydro)	57.8	52.3	65.3
Grid connected generation (GWh)	**2010**	**2020**	**2030**
Renewable energy electricity production in GWh (excluding medium and large hydro)	10,920	645,840	1,265,760
Renewable energy share of electricity consumption in % (excluding medium and large hydro)	5.6	9.1	10.2
Large- and medium-scale hydropower generation in GWh (more than 30 MW)	141.6	2.864	5.371
Large- and medium-scale hydropower generation (more than 30 MW) as share of electricity consumption (%)	72.8	40.5	43.5
Total renewable energy generation in GWh (including medium and large hydro)	152.52	3,505.64	6,686.76
Total renewable energy penetration in electricity consumption (%) - (including medium and large hydro)	78.4	52.3	65.3

2.4.3 AA Roll-out and Implementation Actions

The alignment between SE4ALL and the project focus of the President's Recovery Plan (PRP) means that the implementation plan for achieving the renewable energy generation and rural energy priorities of the PRP will, *de facto*, be the implementation plan for SE4ALL.

Mini-grids

The path to the achievement of renewable energy-powered mini-grids is clearly through the DFID initiative to install 90 solar energy and solar hybrid systems, at least 40 of which are to be mini-grids serving light industrial, commercial, and residential customers in the adjacent communities. Intended to be operated by the private sector and the communities themselves, the development of the Mini-grids provides a significant opportunity for private sector involvement in the clean energy sector.

Solar Home Systems

Likewise, the PRP's ambitious goal of 250,000 Solar Home Systems has spurred the development numerous small for-profit solar companies and not-for profits, such as Barefoot Women Solar Engineers, as well as the Sierra Leone Renewable Energy Association. The latter led the successful campaign for inclusion of an exemption of solar imports from import duties and other taxes in the Finance Bill of 2017.

Need for SE4ALL and Donor Support

If these initiatives are to bear fruit, however, additional work needs to be done to develop adequate business models for the mini-grids, i.e., working with the government to find approaches to make the electricity affordable while covering operating and future investment costs. This will require continued involvement of donors in piloting business models and should encompass the creation of investible mini-grids for the recently completed Bankasoka, Makali, and Charlotte mini-hydro generators.

Likewise, the nascent solar industry, as individual companies and collectively, will need continued support of the type that it has received from Sierra Leone Opportunities for Business Action (SOBA), a DFID-funded private sector development programme that uses market systems approaches to facilitate pro-poor economic growth, if it is to make its potential contribution to the electrification of individual households in rural areas.

Table 21: Action Agenda for increasing electricity access

No,	Action	Action description	HIA	2015-2020	2020-2030
1 - Action Agenda for increasing electricity access					
1,1	Population served with Electricity		(%)	44%	92%
1,2		Increasing installed power generation capacity from the current 97,4 MW to 1000 MW by 2018		X	
		Completion of the CLSG line and executing the West African Power Pool, negotiating a power purchase agreement with Côte D'Ivoire, and identifying power purchase opportunities from Mano River Union countries;		X	
		Implementing the National Electricity Act (2011); this calls for the establishment of an electricity generation and transmission company, an electricity distribution and supply authority and an energy asset unit		X	
		Undertaking a cost based national electricity tariff study, with a view to meeting both commercial and social objectives required for development.		X	
		There is a need to conduct additional pilot programmes supporting the introduction of Multi-functional Platforms in rural areas and serving, for		X	

No,	Action	Action description	HIA	2015-2020	2020-2030
		example, cooperatives and women organisations			
		Small-scale biomass for rural electrification and establish programmes for women in renewable energy (WIRE)		X	
		The Barefoot Women Solar Engineers Strategy will be rolled out to all districts, so that remote areas likely to be off the national grid will have access to affordable and sustainable energy.		X	
		Investigating the opportunities to use off-grid solar power services, and promoting the creation of markets for solar technologies through the private sector (such as solar photovoltaic, solar water heating, solar lanterns, solar refrigerators, solar cooking and solar water pumps)		X	
2 - Action Agenda for increasing access to modern cooking fuel					
2,1		Expanding the use of LPG		X	
3 - Action Agenda for increasing the share of renewable energy					
3,1		Bumbuna Hydro Project - 2nd 161 kV transmission line to Freetown		X	
3,2		Feasibility, environmental and social impact studies for 85 MW hydro project between Kenema and Kono Districts		X	
		Rural Solar Electrification (Barefoot Initiative)		X	X
4 - Action Agenda for increasing energy efficiency					
4,1		All measures are policy and regulatory enabling measures (see below)		X	
Source:		*National SE4Focal Point / EU TAF Expert team / ECREEE*			

2.4.3.1 Financial Sources for the SE4ALL Initiative

2.4.3.2 Committed Financing Resources

None of the projects listed has committed financial resources.

2.4.3.3 Potential Financing Resources

The following Table 22 presents a list of multilateral and bilateral donor institutions which could be contacted by the Sierra Leone Government and the private developers for financing of SE4All Investment Projects.

Table 22: List of multilateral and bilateral donors and other sources of funding

Multilateral and Bilateral Donors and Other Sources of Funding	
Name	**Sponsor**
Adaptation Fund	United Nations Framework Convention on Climate Change
African Development Fund (ADF)	AfDB
Alliance for Rural Electrification (ARE)	
Climate Investment Funds	
EU Energy Initiative - Partnership Dialogue Facility (EUEI PDF)	EU Commission and EU member states

Multilateral and Bilateral Donors and Other Sources of Funding	
Global Bioenergy Partnership (GBEP)	
Directorate-General for International Cooperation and Development (DEVCO)	EU
EU ElectriFi – On-grid investment support	EU
Global Environment Facility (GEF)	
Global Green Growth Institute (GGGI)	
International Investment Bank (IIB)	
International Renewable Energy Agency (IRENA)	
The Nordic Development Fund (NDF)	
Organization for Economic Co-operation and Development (OECD)	
The OPEC Fund for International Development (OFID)	OECD
The Renewable Energy and Energy Efficiency Partnership (REEEP)	
United Nations Development Program (UNDP)	United Nations (UN)
United Nations Economic Commission for Africa's (ECA)	United Nations (UN)
The United Nations Environment Program (UNEP)	United Nations (UN)
United Nations Industrial Development Organization (UNIDO)	United Nations (UN)
The International Bank for Reconstruction and Development (IBRD)	World Bank
The International Development Association (IDA)	World Bank
The International Finance Corporation (IFC)	World Bank
The Multilateral Investment Guarantee Agency (MIGA)	World Bank

Bilateral Donors	
AusAid	Australia
Austrian Development Cooperation (ADC)	Austria
Department of Foreign Affairs, Trade and Development	Canada
DANIDA	Denmark
IFU	Denmark
Global,finland	Finland
Agence Française de Développement (AFD)	France
French Facility for Global Environment (FFEM)	France
The Federal Ministry for Economic Cooperation and Development (BMZ)	Germany
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	Germany
Kreditanstalt fur Wiederaufbau (KfW)	Germany
Irish AID	Ireland
Japan International Cooperation Agency (JICA)	Japan

Bilateral Donors	
Lux-Development	Luxembourg
The New Zealand Aid Program (NZAID)	New Zealand
Norwegian Agency for Development Cooperation, (NORAD)	Norway
Spanish Agency for International Cooperation for Development (AECID)	Spain
Swiss Agency for Development and Cooperation (SDC)	Switzerland
Department for International Development (DFID)	United Kingdom
International Climate Fund	United Kingdom
USAID	United States
US Trade and Development Agency (USTDA)	United States

EU Electrification Financing Initiative (ElectriFI)

The Electrification Financing Initiative (ElectriFI) is a facility supporting investments that provide access to affordable, reliable, sustainable, and modern energy in developing countries. The initial amount of EUR 74.85 million contributed by the European Commission to ElectriFI will be implemented by FMO jointly with the EDFI Association of 15 European Development Banks (www.edfi.eu).

- ElectriFI funding is designed to provide **interim financing solutions** to help projects overcome obstacles or otherwise reach a sufficiently mature stage where the private sector can take over.
- ElectriFI will not compete with other funders but seeks to **collaborate with** and complement other funders.
- Funding must lead to **increased or improved end-user access** to affordable, reliable, sustainable, and modern energy.
- Funding will only be directed towards those projects capable of achieving **stand-alone financial viability**.
- Applicants must have the necessary **skills and capacity** to deliver the results aimed by their respective project proposals whilst meeting commitments with all key project stakeholders, including ElectriFI.

Context of Interventions

ElectriFI can provide funding and support to developers/investors across a range of business models. This includes not only projects operating on the Independent Power Producer (IPP) model benefiting from contractually-based revenue streams, but also those businesses that are exposed to full market forces of supply and demand. Where innovative business models are proposed, **replicability** and **scalability** will be important considerations.

Project development usually follows a well-defined path beginning with market analysis and validation, and then moving into a pre-development stage during which sponsors may *inter alia* secure land, acquire resource data, complete a pre-feasibility study and environmental impact assessment, and reach a formal understanding with authorities. This generally marks the end of pre-development and the beginning of the “active development” stage of the project life-cycle.

ElectriFI will only consider projects or businesses that have at least entered the active development stage.

2.5 IP Framework

2.5.1 Linkage between AA and IP

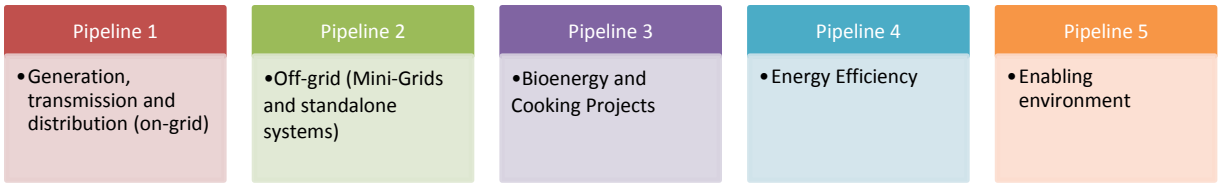
The objective of the IP is to achieve the SE4ALL goals by identifying and developing a set of implementable programs and projects, including their investment requirements, which can be presented to potential private and public investors. It aims to present the short to long term energy priorities of the Government of Sierra Leone for the operationalization of the country's SE4All AA.

Table 24: Time Frame of the IP

Short Term	Medium Term	Long Term
Projects to be implemented between 2016 and 2020	Projects to be implemented between 2021 and 2025	Projects to be implemented between 2026 and 2030

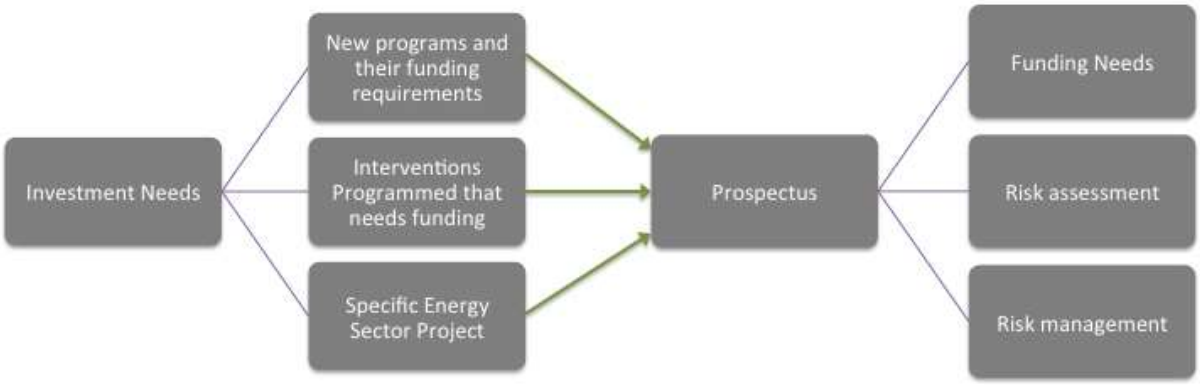
The IP has been developed for the Sierra Leone Government in order to attract investment in the country's energy sector, and in particular to address the country's SE4All goals of ensuring universal access to modern energy services, doubling the global rate of improvement in energy efficiency and doubling the share of renewable energy (RE) in the global energy mix by 2030 thus, the IP is focused on 5 pipelines defined in Figure 9 below:

Figure 9: Focus of the IP



With regard to investment opportunities, the IP is consistent with the priority action areas which were identified in Sierra Leone's SE4All Action Agenda. The IP thus presents a unique opportunity to translate the targets enumerated in the SE4ALL AA into investment opportunities. It also offers further clarity on the trajectory and measures to reach the targets set by highlighting key enabling environment issues. This IP therefore serves as a bridge to outline current funding needs for meeting the SE4ALL AA targets and to present a pipeline of opportunities. To facilitate the dissemination to prospective investors and stakeholders the Sierra Leone IP is presented as a consolidated portfolio of opportunities presented in context, in the figure below.

Figure 10: Development process of the Investment Prospectus



2.5.2 IP Portfolio Management

As noted earlier in this report, Sierra Leone is faced with two challenges: to recuperate war-ravaged generation, transmission, and distribution infrastructure and to massively expand the system to meet unserved demand for electricity and its ambitious SE4ALL goals. The government's strategy is to reform the electricity sector through unbundling of functions and development of a new institutional and regulatory framework.

As presented below, there is a substantial list of policy and capacity-building enabling measures required for broader project development. These need to be prioritized by the SE4ALL Investment Prospectus Committee for presentation.

In parallel, a number of projects have been included in the President's Recovery Priorities Program, and are tracked weekly by one of four groups: Generation, Transmission and Distribution, Off-Grid, and Governance. In some cases, the projects are underway and fully funded, in other cases, partially funded, and in others, without identified funding. Fiches will be prepared for qualifying projects needing partial or full funding.

They will then be tracked by the appropriate committee.

2.5.3 Implementation Arrangements

As noted above, the government officials responsible for implementing the various parts of the President's Recovery Priorities Programme will continue to track the priority projects until completion.

2.5.4 Monitoring and Evaluation

The groups tracking the implementation of the President's Recovery Priorities Programme will provide ongoing monitoring of the projects. It is not clear what, if any, evaluation arrangements have been, or will be, made.

2.6 SE4All – Enabling Environment

2.6.1 On-grid (Generation, Transmission, and Distribution)

The measures and projects undertaken or envisaged by the Sierra Leone Government are listed in the following tables.

Table 23: On-grid (Generation, Transmission, and Distribution) - Institutional framework

Measure	Value – Assessment - Statement
Grid connected RE electricity generation	
Develop an Energy Act.	2015 - 2016
Review the National Energy Policy, 2009	2015 - 2016
Implement the National Electricity Act 2011	2011 - date
Implement the Electricity and Water Regulatory Commission Act 2011	2011 - date
Review the Power Generation Act 2006	2015 - 2017
Promote the Financing Act 2013 on duty free concession on RE equipment and materials	2015 to 2017
Provide incentives for the importation and application of renewable equipment/ devices.	2015 to 2018
Introduce an appropriate Legal Framework to support the development of a Renewable Energy Act.	2015 to 2018
Introduce Power Production Tax Credit (PTC) to electricity generation companies aimed at incentivizing the implementation of renewable energy.	2015 to 2020
Provide affordable feed-in-tariffs (FIT) to incentivize electricity producers.	2015 to 2018
Adopt a Public Benefits Fund (PBF) which requires that a certain percentage of the tariff be dedicated to supporting renewable energy generation projects on and off the grid.	2015 to 2025
Prioritize the installation of RETs in remote and underdeveloped communities	2015 to 2030
Set up institutions to produce and assemble RE devices	2015 to 2030
Set targets and tracking systems to monitor the contribution of RE in the national energy mix.	2015 to 2020
Off-take obligation	To be determined
Regulation of RE electricity generation remuneration	To be determined
Priority access to the grid	To be determined
Grid connected rural electrification & densification	
Rural electrification master plan	To be determined
Regulation regarding local network connection	To be determined

Source:	*National SE4Focal Point / EU TAF Expert team / ECREEE*

Table 24: On-grid (Generation, Transmission, and Distribution) - Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Transmission & distribution system for Charlotte 2.2 MW hydropower plant	MoE	2017-2019
Transmission & distribution system for Banasoka 2.2 MW hydropower plant	MoE	2017-2019
Transmission & distribution system for Betmai hydro IPP - 25MW	MoE	2017-2019
Newton 6 MW Solar Park	Under development	2017-2019
Solar Era IPP - 5 MW	Private	2017-2019
Source: *National SE4LL Focal Point / EU TAF Expert team / ECREEE*		

2.6.2 Off-grid (Mini-grids and Standalone Systems)

The measures and projects undertaken or envisaged by the Sierra Leone Government are listed in the following tables.

Table 25: Off-grid (Mini-grids and Standalone Systems) - Institutional framework

Measure	Value
Develop hydropower projects in the country, including development of pico hydro schemes.	2015 to 2030
Introduce Public private partnerships and promoting indigenous participation in hydropower development.	2015 to 2020
Support to private initiatives	Donor support
Specification of norms and best practices	Planned, with multiple stakeholders
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*	

Table 26: Off-grid (Mini-grids and Standalone Systems) - Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Rural access to electricity for 125,000 to 250,000 households	MOE	2016-2018
10,000 solar lights in chiefdom HQ towns	MOE	2016-2018
School, hospital solar systems	MOE	2016-2018
Feasibility studies for 200 mini-grids	To be determined	
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*		

2.6.3 Bioenergy and Efficient Cook-stoves

The measures and projects undertaken or envisaged by the Sierra Leone Government are listed in the following tables.

Table 27: Bioenergy and Improved Cook-stoves - Institutional framework

Measure	Value
Develop national strategy for …	Ministries of Energy (MoE), Trade & Industry (MoTI), Agriculture, Forestry & Food Security (MoAFFS) and stakeholders
Institutional support structure	National Cooking Energy Stakeholder Group, headed by MoE
Promotion programmes	Ministry of Energy (MoE), Ministry of Trade & Industry (MoTI) Ministry of Agriculture, Forestry & Food Security (MoAFFS), United Nations Development Programme (UNDP), and European Union (EU)
Incentive programmes	TBD
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*	

Table 28: Bioenergy and Improve Cook-stoves - Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Various training and capacity building	MoE, MoTI, MoAFFS, UNDP,	2015-2020

Name of Project / Initiative	Institution	Time horizon
programs for producers, user groups, enterprises	and EU	
Formation of National Cooking Energy Stakeholder Group (CESG)	MoE, development partners, private sector groups	2015-2020
Promotion of efficient charcoal production	MoE, MoTI, MoAFFS, UNDP, and EU	2015-2020
Create network of micro-enterprises for delivery of improved biomass fuels	MoE, MoTI, MoAFFS, UNDP, and EU	2015-2020
Improve efficiency and sustainability of the cooking value chain through participatory and sustainable forestry management	MoE, MoTI, MoAFFS	2015-2020
Promotion of LPG	MoE, MoTI	2015-2020
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*		

2.6.4 Energy Efficiency

The measures and projects undertaken or envisaged by the Sierra Leone Government to promote energy efficiency in Sierra Leone are listed in the following tables.

Table 29: Energy Efficiency - Institutional framework of the energy sector

Measure	Value
National energy efficiency strategy	TBD
Energy efficiency agency	TBD
EE promotion programmes	Planned
EE investment incentives	Planned
Adoption of Minimum Energy Performance Standards (MEPS) for on-grid and off-grid lighting devices	2015 to 2017
Environmentally sound management through the implementation of a collection and disposal system for energy efficient light bulbs	2015 to 2030
Market assessment of key-energy using appliances	2015 - 2020
Implementation of standards and labels	2015 - 2017
Building capacity among national standards bodies and other stakeholders	2015 - 2017
Raising awareness on energy-efficient appliances for national authorities, the commercial sector and the general public	2015 - 2016
Financing for the diffusion of energy-efficient appliances	2015- 2018
Introduction of energy efficiency criteria into the national building code and establishing a link to the ECOWAS Directive for Energy Efficiency in Buildings (EDEEB)	2015 to 2016
Developing and implementing a system to award energy performance certificates for public buildings in Sierra Leone	2015 to 2020

Introduction of improved management practices and technical measures to diminish losses in the electricity distribution system	2015 to 2025
Promotion and widespread dissemination of efficient cook-stoves in Sierra Leone	2015 to 2020
Formation of a National Cooking Energy Stakeholder Group (CESG)	2015 to 2020
Promotion of efficient charcoal production	2015-2020
Create a self-sustaining entrepreneurial network of rural micro-enterprises for delivery of improved biomass fuels	2015-2020
Promotion of the use of energy efficient fish smoking kilns for artisanal fish smoking	2015-2020
Promotion of Liquefied Petroleum Gas (LPG)	2015-2020
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*	

Table 30: Energy Efficiency - List of Ongoing Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Adoption of Minimum Energy Performance Standards (MEPS) for lighting devices	MoE, MoTI	2015-2017
Supporting EE lighting policies through awareness raising with final consumers	MoE, MoTI, MWH&I	2015-2017
Establish system for monitoring, verification, and enforcement of MEPS for lighting	MoE, MoTI	2015-2017
Market assessment of appliances, implementation of standards and labels, capacity building on standards and labels, financing for energy-efficient appliances	MoE, MoTI	2015-2017
Analogous sets of activities for buildings		
Introduction of improved management practices and technical measures to diminish losses in the electricity distribution system	Ministry of Energy (MoE), Electricity & Water Regulatory Commission (EWRC), Electricity Distribution & Supply Authority (EDSA) and Electricity Generation & Transmission Company (EGTC)	2015-2025
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*		

2.6.5 Enabling Environment

During the course of the development of the Investment Prospectus, two significant changes in the enabling environment took place. The Electricity & Water Regulatory Commission (EWRC) was established in the Ministry of Energy, a critical step for the establishment of tariffs and regulation of the relationships of the various participants in the sector.

The second change was the introduction of an exemption from import duties and other taxes for imported solar equipment, contained in the Finance Bill of 2017 with imminent passage expected as of this writing. An associated regulation would establish a so-called green lane at customs for clean energy equipment.

Table 31: Enabling Environment - Institutional framework

Measure	Value – Assessment - Statement
Legal framework	The National Energy Strategic Plan (September, 2009)[24]
Institutional framework	MoE
Promotion of private investment	To be determined
Enabling structures for local initiatives	To be determined
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*	

Table 32: Enabling Environment - Projects / Initiatives

Name of Project / Initiative	Institution	Time horizon
Establish renewable energy and energy efficiency policies	GoSL	2017-2020
Develop clean energy tax incentives	MoE, MoTI and MoFED	2015-2016
Capacity building for power production, grid expansion, and operation	MoE	To be determined
Assess feasibility of RE projects having pre-feasibility or scoping studies	MoE	To be determined
Establish collection account and sector-wide budget		To be determined
Source: *National SE4Focal Point / EU TAF Expert team / ECREEE*		

[24] http://www.ecowrex.org/system/files/repository/2009_energy_strategic_plan_-_min_ener.pdf

3 PIPELINE OF SE4ALL PROJECTS

3.1 IP Pipeline

3.1.1 Time Horizon

The objective of the IP is to contribute to the achievement of the SE4ALL goals by identifying and developing a set of implementable programs and projects, including their investment requirements, which can be presented to potential private and public investors. It aims to present the short to long term energy priorities of the Government of Sierra Leone for the operationalization of the country's SE4All AA.

Table 33: Investment Prospectus – Time Line

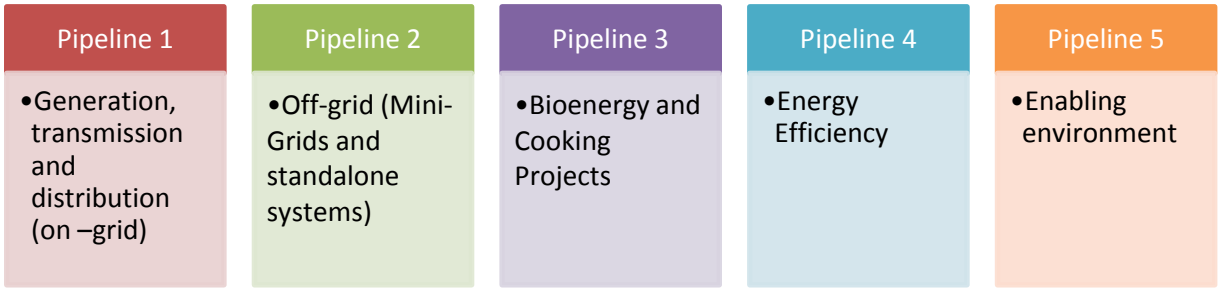
Short Term	Medium Term	Longer term
Projects to be implemented between 2016 - 2020	Projects to be implemented between 2021 -2025	Projects to be implemented between 2026-2030

3.1.2 SE4All IP Pipelines

The IP is developed for the Sierra Leone Government in order to attract investment in the country's energy sector, and in particular to address the country's SE4All goals of ensuring universal access to modern energy services, doubling the global rate of improvement in energy efficiency and doubling the share of renewable energy (RE) in the global energy mix by 2030 thus.

They are grouped into 5 "pipelines": the first two pipelines are related to access to electricity (on-grid and off grid); sustainable and clean cooking (biomass energy and biogas); energy efficiency; and finally, projects contributing to improve the investment environment.

Figure 11: Five ECOWAS SE4All IP Pipelines



Source: ECREEE IP Flyer – Annex 1

3.1.3 Eligibility Criteria

3.1.3.1 General IP Criteria

- Project alignment with AA: contribution to the SE4ALL objectives in terms of increased access to electricity, increased access to sustainable modern cooking fuel, use of renewable energy, increased energy efficiency
- Alignment with relevant national plans (Master Plan, etc,)
- Probability of implementation

- Sustainability
- Scalability/Easy replication
- Project timeline
- Social inclusion (Number of Beneficiaries, gender approach, poverty alleviation…),

3.1.3.2 Specific Country IP Criteria

- P1
  - Respect of the Energy Master plan and the main orientations of the country
  - Precision on the process: established with the DGE and under the Technical Committee's supervision
- P2
  - Respect the Energy Master Plan and the main orientations of the country
  - No exclusion of the future means of production linked to the grid
  - Management model: private operator (electricity code)
  - Autonomous Individual Systems: penetration capacity and diffusion rate / simple replication
- P3
  - Proved penetration capacity and diffusion rates
  - Previous Demonstration
  - Valorisation of the residue not the agricultural resource
  - No competition with food use
- P4
  - 20% of gains relative to the reference scenario (« baseline ») during the investment period
  - Part of a pragmatic approach for tertiary buildings (large size)
- P5
  - Alignment to the priorities of the Agenda Action SE4ALL, Regulations, SDG7

3.2 Investment Prospectus Projects

3.2.1 Short term projects with fiches

The following table lists the projects included in this Investment Prospectus. The respective Project Fiches are presented in the following Annex 1 (Chapter 4.1).

Table 34: Investment Prospectus Projects

Reference	Promoter	Project description	Total cost M €	Financing Need M€ / %	Nature of need
Pipeline 1 : On-grid projects					
SL_P1-1	Sewa Energy Resources	Betmai Hydropower Project	95.0	60.0; 63%	Equity/Senior Debt/Grant
SL_P1-2	Riverblade Holdings NV	Riverblade Hydropower Project	52.0	37 ;70%	Equity/Debt/Grant
SL_P2-1	Teleficient (SL) Ltd.	Sierra Leone Teachers Union PAYGO Rural Electrification Project.(small scale solar solutions)	0.95	0.95;100%	Grant
Pipeline 2 : Off-grid projects					
SL_P2-2	Wordsworth Cole and Jonathan Thomas	Bboxx – S.L. (promotion of packaged PV solutions	2.0	1.75; 88%	Convertible debt/equity
Pipeline 3 : Bioenergy and Clean cooking					
SL_P3-1	Westwind Energy (SL) Limited	Manufacturing and Distribution of ICS in Sierra Leone	0.35	0.31; 89%	Equity/Debt/Grant
SL_P3-2	Masada Waste Transformers JV (under establishment)	Turning waste into opportunity for socially inclusive growth: Unlocking the potential of biogas in Sierra Leone	28.00	≈20; 70% / TBD	Equity/Debt/Grant

3.2.2 Initiatives of interest

A number of investments and NGO initiatives are under development which should receive support from national and international partners. The following table lists these project initiatives.

Table 35: Project Initiatives of Interest

Reference	Project Name	Technology Type	Project Cost (€)	Sponsor Contacts
SL_I-1	GIZ EnDev Supply	Various		Hartlieb Euler hartlieb.euler@giz.de +231 886 116 405
SL_I 2	GIZ EnDev Demand	Various		Hartlieb Euler hartlieb.euler@giz.de +231 886 116 405
SL_I 3	25 MW Solar Era	Solar PV power plants	Consultant's estimate €35.000.000	Sophie Johnson sophie@solarera.eu +44 7947 460 367
SL_I 4	Moyamba Hydro	15.4 MW Small Hydro power plant	Estimated cost around 100 Mio USD	UNIDO Renewable and Rural Energy Unit / Energy Branch Tel: +43-1-26026-3819| Fax: +43-1-6803
SL_I 5	Distribution of pico- solar solutions	Pico Solar	To be confirmed	
SL_I 6	DFID/UNOPS project for 90 rural hospitals (operators/owners)	PV and PV/Diesel Hybrids PPPs	USD $44.000.000	Nick Gardner nickg@unops.org +232 (0) 78 802 512
SL_I 7	T&D for Banasoka	Electrical grid		
SL_I 8	T&D for Makali	Electrical grid		
SL_I 9	T&D for Charlotte	Electrical grid		
SL_I 10	Sierra Leone Solar Lantern Initiative	PV		

Reference	Project Name	Technology Type	Project Cost (€)	Sponsor Contacts
SL_I 11	Repair/Expansion PowerNed Off-grid 250kW mini-grid, Yele	Mini-Hydro		**Donald Keus** donald.keus@gmail.com +31651356449 / +23279405464
SL_I 12	Easy Solar	Distribution of Pico Solar Systems		

4 ANNEXES

4.1 Annex 1: Project Fiches

4.1.1 Pipeline 1: On-Grid (Generation, transmission and distribution)

IP Code: SL_P1_1

GENERAL INFORMATION	
NAME OF THE PROJECT	**Betmai Hydropower Project**
PROJECT OWNER/ DEVELOPER	Sewa Energy Resources Ltd (SERL) + Sierra Leonean
CONTACT INFORMATION	3 Howe St, Freetown, Sierra Leone kofie.macauley@camserv.dk Tel. + 232 76300600
TYPE OF ORGANIZATION	Independent Power Developer
COUNTRY - PROJECT LOCATION	Kafe Simira and Tane Chiefdoms, Tonkolili District of the Northern Province
PROJECT DESCRIPTION	25 MW grid-connected hydroelectric project
TECHNOLOGY TYPE	Hydropower
EXPECTED RESULTS/OUTCOMES	130 GWh p.a., including the construction 28 km of new 66KV transmission line and substations 19 – 20 % Return on Equity
SPONSOR'S EXPERIENCE IN SIMILAR PROJECTS	• 45 MW Kokish Hydroelectric Project (http://www.namgis.bc.ca/companies/kwagis-power- limited-partnership/; https://renewableops,brookfield,com/en/Presence/N orth-America/Recreation-and-Safety/Kokish-River- Hydro) • 9 MW McNair Creek Hydroelectric Project (http://www.blueearthrenewables.com/portfolio/mcnai r-creek-hydro-facility/) • 41 MW Big Silver Creek / 18 MW Northwest Stave / • 33 MW Upper Stave Hydroelectric Project (http://www.innergex.com/en/sites/) • 600 MW Lower Kafue Gorge Hydroelectric Project (Zambia)
CONTRIBUTION TO SE4ALL GOAL(S)	25 MW
PROJECT STATUS	
PROJECT APPRAISAL INDICATORS	**Completed:** • Business plan • Pre-feasibility study • Feasibility study • Domestic permitting, including water license, land leases and ESIA

	Ongoing: • Pre-construction activities / interaction with EPC contractors • PPA negotiation • ESIA (update)
EXPECTED COMPLETION OF DEVELOPMENT PHASE	Please indicate expected date
EXPECTED FINANCIAL CLOSING BY	2017 - 2018
EXPECTED START OF PROJECT IMPLEMENTATION	2018
EXPECTED DATE OF COMMISSIONING/DEPLOYMENT OF SOLUTION	2019-2020
FUNDING STRUCTURE AND FUNDING NEEDS	
TOTAL COST OF THE PROJECT (Euro)	EUR 95 Million ($102USD)
FINANCIAL STRUCTURE FOR THE TOTAL COST OF THE PROJECT	Foreseen debt/equity ratio for development: 0% / 100% Foreseen debt/equity ratio for implementation: 70% / 30%
SECURED FUNDS FOR THE TOTAL COST OF THE PROJECT (Euro)	Please indicate secured funds of total cost for development (amount and percentage) EUR 5 Million Please indicate secured funds of total cost for implementation (amount and percentage)
FINANCING GAP (Euro)	EUR 60+ million for senior debt
PROCUREMENT MODEL	Direct negotiation of PPA

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IP Code: SL_P1_2

GENERAL INFORMATION	
NAME OF THE PROJECT	**Riverblade Hydropower Project**
PROJECT OWNER/ DEVELOPER	Riverblade Holding B.V., in the Netherlands, established and owned by Donald Keus and Wouter Kreuwel – the operating company in Sierra Leone is Multi Experience Company (MEC) Ltd in Sierra Leone, for 100% owned by Riverblade Holding BV.
CONTACT INFORMATION	**MEC Ltd**: Hut 1, Family Kingdom Resort, Aberdeen/Freetown, Sierra Leone, Registrar of Companies CBR/12 No, 0005864; **Riverblade Holding BV**: Zwarte Kamp 24, 4191 KP, Geldermalsen, registered under number 65545427 in the Commercial Register of the Dutch Chamber of Commerce; **Donald Keus** M: +31651356449 / +23279405464 E: donald.keus@gmail.com **Wouter Kreuwel** M: +31 6 30 05 62 70 E: wouter.kreuwel@gmail.com
TYPE OF ORGANIZATION	Independent Power Producer (IPP) – the sponsors are currently finalizing the application for the IPP license, at the Energy & Water Regulatory Commission (EWRC) in Sierra Leone
COUNTRY - PROJECT LOCATION	Sierra Leone, 5 locations (river based) for the first rollout phase, +6-8 locations for the second rollout phase
PROJECT DESCRIPTION	Providing access to affordable, clean and reliable electricity on the basis of hydro power generation in Sierra Leone, from river-based small-scale hydro power stations (1-10MW each). Minor part of the investments is targeted at T&D infrastructure, including mini-grid / off-grid delivery to off-takers.
TECHNOLOGY TYPE	Small scale run-of-river hydropower
EXPECTED RESULTS/OUTCOMES	For the first 5 locations: up to 20MW, meaning generation of around 170GWh per year, IRR for equity investors: 19%, Expected turnover: 5.5M€ in Year 1 to 22,1M€ in Year 4, which is without reinvestments, Payback period: 4.5 years Breakeven point: 1 year
SPONSOR'S EXPERIENCE IN SIMILAR PROJECTS	Donald Keus has built a mini hydro in Yele (Sierra Leone) with 250kW capacity, delivering via own mini-grid to 400 households and 15 companies in the local community. Furthermore, he has rehabilitated a water purification plant and built a hospital and a palm oil factory in the same area (having earned him a Paramount Chief status).
CONTRIBUTION TO SE4ALL GOAL(S)	First rollout phase up to 20MW installed (output capacity is currently being determined in final stage of Riverblade's Feasibility Study). For 1MW of this capacity mini-grid off-take development is planned. Around 90% of the output is planned to be fed into the grid.

PROJECT STATUS	
PROJECT APPRAISAL INDICATORS	• Business plan (ready) • Pre-feasibility study (ready) • Feasibility study (ready by May 19, 2017 by Witteveen+Bos & subcontractors) • Risk assessment + mitigation plan (discussions ongoing with The World Bank and the African Development Bank, for Partial Risk Guarantee on the off-take by EDSA in Sierra Leone) • EIA/SIA (ready by May 19, 2017 – part of the feasibility study)
EXPECTED COMPLETION OF DEVELOPMENT PHASE	September 2017
EXPECTED FINANCIAL CLOSING BY	Target December 2017, but might become Q1/Q2, 2018
EXPECTED START OF PROJECT IMPLEMENTATION	May/June 2018
EXPECTED DATE OF COMMISSIONING/DEPLOYMENT OF SOLUTION	January 2019
FUNDING STRUCTURE AND FUNDING NEEDS	
TOTAL COST OF THE PROJECT (Euro)	52M€
FINANCIAL STRUCTURE FOR THE TOTAL COST OF THE PROJECT	Foreseen Debt/Equity ratio for development: 90/10 Foreseen Debt/Equity ratio for implementation: 70/30
SECURED FUNDS FOR THE TOTAL COST OF THE PROJECT (Euro)	Development Phase (est. total 700K€): - Feasibility Study, secured (400K€ Convertible Grant, FMO & EAIF) • Legal support for contract documents with GoSL, finalizing application (100K€ Convertible Grant, via EAIF) • Technical support (employer's requirements, basic designs, etc.) for selecting EPC contactor, finalizing application (200K€ Convertible Grant, REPP) • Implementation phase (est. total 51,3M€) • Sponsors shortlisted a few potential equity partners for taking majority share in company for equity investment (~30% of total financing), Talks have started but interested developers are still welcomed for discussion, Sponsors (Riverblade Holding BV) target to retain 30% of the shares, • Current feasibility study financiers (FMO & EAIF) are to take mandated lead Aarranger role for senior debt part (~70% of total financing)
FINANCING GAP (Euro)	See the previous - Implementation Phase left for financing (est. total 51.3M€)
PROCUREMENT MODEL	Direct negotiation of PPA with competent authority in GoSL (PPP unit of Ministry of Finance & Economic Development; off-taker will be EDSA, the Energy Distribution & Supply Authority, subsidiary of the Ministry of Energy in Sierra Leone).

4.1.2 Pipeline 2: Off-grid (Mini-Grids and standalone systems)

IP Code: SL_P2_1

GENERAL INFORMATION	
NAME OF THE PROJECT	**Sierra Leone Teachers Union PAYGO - Rural Electrification Project.(small scale solar solutions)**
PROJECT OWNER/ DEVELOPER	Teleficient (SL) Ltd, – Al Turay, CEO - Sierra Leonean
CONTACT INFORMATION	al.turay@teleficient.com **Phone: 232-76-638924/001-919-889-6000** 4 Gloucester Street, Freetown, Sierra Leone
TYPE OF ORGANIZATION	For Profit – Limited Corporation Company
COUNTRY - PROJECT LOCATION	Initial deployment in the Western Area Rural, Northern Province, Southern Province, and Eastern Province.
PROJECT DESCRIPTION	This will be a pay-as-you-go (PAYGO) project to assist rural educators (teachers) within the Sierra Leone Teachers Union with their power needs which in turn can create a positive teacher work force that will help teachers all around the country to obtain solar home systems (SHS) in an affordable way. This, as a result, will have an impact in the way they prepare for their teaching duties during the night with longer night time to read, research and review assignments etc., and even create small study groups at night outside the classroom.
TECHNOLOGY TYPE	Azuri PAYGO Affordable Quad Home Solar System will be deployed at each teacher's home to be paid for according to a 24-month contract via monthly payroll deductions or weekly mobile money payments.
EXPECTED RESULTS/OUTCOMES	Please indicate the number of GWh (for generation projects) or length (km)/Capacity(MVA) (for transmission/distribution lines projects). Under development. *Please indicate IRR, expected turnover and payback period and breakeven point.*
SPONSOR'S EXPERIENCE IN SIMILAR PROJECTS	
CONTRIBUTION TO SE4ALL GOAL(S)	With projected feasibility for this projects, at the end of full deployment, the project will benefit over 40,000 teacher homes with their energy needs across the country.
PROJECT STATUS	
PROJECT APPRAISAL INDICATORS	Please indicate studies already undertaken • Business plan • Pre-feasibility study • Feasibility study

	• Risk assessment + mitigation plan • EIA/SIA Other studies are ongoing.
EXPECTED COMPLETION OF DEVELOPMENT PHASE	31/12/2020
EXPECTED FINANCIAL CLOSING BY	09/30/2017
EXPECTED START OF PROJECT IMPLEMENTATION	01/01/2018
EXPECTED DATE OF COMMISSIONING/DEPLOYMENT OF SOLUTION	Deployment will be replicated by provinces to cover entire 12 districts and the rural western areas of Freetown in 24 months period. Expected to start deployment 1/1/2018
FUNDING STRUCTURE AND FUNDING NEEDS	
TOTAL COST OF THE PROJECT (Euro)	Initial deployment of 5.000 Azuri Quad systems CIF and operation cost to deploy all 5,000 SHS is €950,000 ($1,000,000)
FINANCIAL STRUCTURE FOR THE TOTAL COST OF THE PROJECT	The first deployment will cover teachers in the first district, funds collected will be replicated to expand into another district while recycling revenue generated to reach a more wider scale of teachers into all 12 districts. Assuming all districts can successfully be deployed with 2.000-3.000 units per district, by the end of 24 month period we would have deployed 36.000 units across the country in two years with project CAPEX of €6.5 Million Euros ($7.000.000) with equity of €2 Million.
SECURED FUNDS FOR THE TOTAL COST OF THE PROJECT (Euro)	Please indicate secured funds of total cost for development (amount and percentage) No Funds have been secured. Please indicate secured funds of total cost for implementation (amount and percentage) No Funds has been secured.
FINANCING GAP (Euro)	€950,000 ($1,000,000)
PROCUREMENT MODEL	Secured funds will be paid directly to Azuri Technologies at Cambridge, UK who will work with Teleficient (SL) Ltd on periodic supply of their PAYGO Quad units based on deployment requirements until SHS have been provided to teachers in all12 districts.

.IP Code: SL_P2_2

GENERAL INFORMATION	
NAME OF THE PROJECT	**Bboxx – S.L. (promotion of packaged PV solutions**
PROJECT OWNER/ DEVELOPER	Wordsworth Cole and Jonathan Thomas
CONTACT INFORMATION	34 Wellington St., Freetown, S.L. Tels, +232 79 093 662; +232 88 234 301 Email wcole@bboxx.sl
TYPE OF ORGANIZATION	Limited Company; Franchise of Bboxx – U.K.
COUNTRY - PROJECT LOCATION	Freetown, S.L.
PROJECT DESCRIPTION	Bboxx is a vendor of pay-as-you-go (after down payment) solar home systems, consisting of a 50W PV panel, a 17 amp battery and charge control unit in a PVC box, 4 lamps,1 radio, and required wiring, 1 flashlight with optional DC TV. Bboxx is seeking a convertible debt/equity for expansion of the business.
TECHNOLOGY TYPE	Solar home systems (see above project description)
EXPECTED RESULTS/OUTCOMES	Estimated to be 40% on investment
SPONSOR'S EXPERIENCE IN SIMILAR PROJECTS	Bboxx has successfully implemented this model in Rwanda, Uganda, and D.R. Congo (information available upon request)
CONTRIBUTION TO SE4ALL GOAL(S)	400 kW of systems, serving 40,000 residents
PROJECT STATUS	
PROJECT APPRAISAL INDICATORS	Please indicate studies already undertaken • Business plan
EXPECTED COMPLETION OF DEVELOPMENT PHASE	Under development.
EXPECTED FINANCIAL CLOSING BY	Under development.
EXPECTED START OF PROJECT IMPLEMENTATION	Under development.
EXPECTED DATE OF COMMISSIONING/DEPLOYMENT OF SOLUTION	Under development.
FUNDING STRUCTURE AND FUNDING NEEDS	
TOTAL COST OF THE PROJECT (Euro)	$ USD 2.000.000

FINANCIAL STRUCTURE FOR THE TOTAL COST OF THE PROJECT	Bboxx is seeking convertible debt/equity to finance operations.
SECURED FUNDS FOR THE TOTAL COST OF THE PROJECT (Euro)	Owners estimate company equity at $250.000
FINANCING GAP (Euro)	Under development.
PROCUREMENT MODEL	Under development.

4.1.3 Pipeline 3: Bioenergy and Cooking Projects

IP Code: SL_P3_1

GENERAL INFORMATION	
NAME OF THE PROJECT	**Manufacturing and Distribution of ICS in Sierra Leone**
PROJECT OWNER/ DEVELOPER	Westwind Energy (SL) Limited
CONTACT INFORMATION	Tapsi N'Jai tapsir.njai@westwindenergy.sl +232 (0) 78 405 405
TYPE OF ORGANIZATION	Limited company
COUNTRY - PROJECT LOCATION	Freetown, Sierra Leone
PROJECT DESCRIPTION	Increase the production and distribution of stoves from 250-350 per month to 2.000 per month within 1 year.
TECHNOLOGY TYPE	Efficient Cookstoves
EXPECTED RESULTS/OUTCOMES	To manufacture and distribute 24,000 stoves within the 18 months from the start of the project.
CO-PRODUCTS NEEDED	Under development.
SPONSOR'S EXPERIENCE IN SIMILAR PROJECTS	Westwind Energy manufactures and distributes Wonder Stoves. **Wonder Stoves** are improved biomass cook stoves. They are **40% more fuel efficient** than the traditional stoves sold in Sierra Leone. **Westwind Energy** have been manufacturing and distributing cook stoves since 1990 as Wonder Stove Enterprise, In July 2013, the business was rebranded and incorporated as Westwind Energy (SL) Limited. Westwind Energy (SL) Limited an innovative business model that benefits all income groups along the whole value chain, including suppliers, manufacturers, retailers and customers,

	This generates positive economic, social and environmental effects.
CONTRIBUTION TO SE4ALL GOAL(S)	**Wonder Stoves** are much more efficient than traditional wood stoves. As more households use Wonder Stoves, **fewer trees are destroyed to burn into charcoal, substantially reducing carbon emissions**. The stoves reduce air pollution in the home, thereby improving the health of women and children, They also use less charcoal, saving money for the family. In addition, WestWind Energy manufactures **LPG stoves**, which aim to replace traditional coal with a modern fuel. WestWind's activity aims to contribute to the SE4ALL goals, which for Sierra Leone translates into 100% of the population to be using efficient cooking stoves by 2030, out of which 25% concerns LPG or other cooking fuels. With a target to Manufacture and distribute 24.000 stoves within 18 months as of current date, it is aimed that **more than 100,000 people per year** will have access to clean cooking.
PROJECT STATUS	
PROJECT APPRAISAL INDICATORS	Financials available upon request.
EXPECTED COMPLETION OF DEVELOPMENT PHASE	December 2018
EXPECTED FINANCIAL CLOSING BY	June 2017
EXPECTED START OF PROJECT IMPLEMENTATION	June 2017
EXPECTED DATE OF COMMISSIONING/DEPLOYMENT OF SOLUTION	18 months from start of project implementation, that is December, 2018
FUNDING STRUCTURE AND FUNDING NEEDS	
TOTAL COST OF THE PROJECT (Euro)	*For the development of the production facilities as well as distribution of the products the total cost will be* **€350.0000** This budget includes purchase of equipment, extension of ceramic factory, purchase of vehicles for sales and distribution, marketing activities and working Capital.
FINANCIAL STRUCTURE FOR THE TOTAL COST OF THE PROJECT	The expansion of business activity will require €350,000 of which 15-25% will be owner's equity and the rest will be additional equity investment and bank loan and/or grant.
SECURED FUNDS FOR THE TOTAL COST OF THE PROJECT (Euro)	Currently secured funds amount to 35,000 euro.
FINANCING GAP (Euro)	Financing gap is €315.000.
PROCUREMENT MODEL	Not applicable

IP Code: SL_P3_2

GENERAL INFORMATION	
NAME OF THE PROJECT	Turning waste into opportunity for socially inclusive growth: Unlocking the potential of biogas in Sierra Leone
PROJECT OWNER/ DEVELOPER	Masada Waste Transformers JV (under establishment)
CONTACT INFORMATION	Animata Dumbuya +232 76 242 328 amidumbuya@gmail.com Freetown, Sierra Leone
TYPE OF ORGANIZATION	Independent Power Producer (IPP)
COUNTRY - PROJECT LOCATION	Freetown, Sierra Leone
PROJECT DESCRIPTION	The project proposes an innovative business model that will bring cheaper and cleaner energy across Sierra Leone, while improving waste management, sanitation and delivering significant socio-economic benefits in the country.
TECHNOLOGY TYPE	Biogas from Anaerobic Digestion
EXPECTED RESULTS/OUTCOMES	Upon Request
SPONSOR'S EXPERIENCE IN SIMILAR PROJECTS	The project will be implemented by two partners who have joined forces and agreed to establish a joint venture together: 1)The Waste Transformers BV (TWT) is a Dutch company who specializes in waste-to-energy solutions. TWT started in 2012 when a small group of senior professionals came together to offer their extensive expertise in developing, designing, building and operating of renewable energy and waste management projects to customers around the world. The core commercial team has over 30 years of international experience in the field of Waste-to-Energy. Through international partnerships TWT have a global presence. TWT staff has built or helped developing and building over 35 projects, ranging in size from 50 KW to 5.6 MW in locations such as the Netherlands, UK, South Africa and Canada. 2) Masada Waste Management, is a privately owned company in Sierra Leone, with a 20 year waste management contract from government to collect, dispose, manage and convert solid and liquid waste streams into renewable energy. In the short space of 3 years, this young company has built an impressive

	track record in tackling the waste of Freetown. They currently servicing more than 400 000 clients (households & businesses) Together the partnership has built relationships with the best sector participants over a long period of time. We only partner with experienced and respected contracting groups, who are aligned with our own values and strategy of social entrepreneurship.
CONTRIBUTION TO SE4ALL GOAL(S)	The project partners propose to implement a hybrid Waste-to-Energy (WTE) model in Freetown that will include two medium size 2MW digesters as well as 30 highly innovative small scale (50-100 KW) digesters that will introduce a game changing model to the city. Together the hybrid model will ensure that, over a period of 4 years, +/- 300 tons of municipal solid waste per day will no longer be dumped or go to land fill but will generate a combined net output of **5.89 MW**.
PROJECT STATUS	
PROJECT APPRAISAL INDICATORS	• Business plan (in process) • Land Securement (completed) • Pre-Feasibility study (completed) • Licences & permits (in process) • PPA (in process) • EIA/SIA (in process)
EXPECTED COMPLETION OF DEVELOPMENT PHASE	End 2017
EXPECTED FINANCIAL CLOSING BY	Q1-Q2 2018
EXPECTED START OF PROJECT IMPLEMENTATION	End 2018
EXPECTED DATE OF COMMISSIONING/DEPLOYMENT OF SOLUTION	End 2019
FUNDING STRUCTURE AND FUNDING NEEDS	
TOTAL COST OF THE PROJECT (Euro)	28 million €
FINANCIAL STRUCTURE FOR THE TOTAL COST OF THE PROJECT	Under discussion
SECURED FUNDS FOR THE TOTAL COST OF THE PROJECT (Euro)	Development phase (est. total 1,5 mill USD): Partners have already invested >300,000 for development.
FINANCING GAP (Euro)	TBD
PROCUREMENT MODEL	Direct negotiation of PPA with competent authority in GoSL (PPP unit of Ministry of Finance & Economic Development; off-taker will be EDSA, the Energy

	Distribution & Supply Authority, subsidiary of the Ministry of Energy in Sierra Leone).

4.2 Annex 2: Schedule of meetings

Date	Institution	Persons and contact details	Issues discussed
15 Aug 2016	Ministry of Energy	Minister of Energy	• Presentation of the IP concept and discussion on the areas to be covered
15 Aug 2016	Ministry of Energy	See list of participants 1	• Presentation of the IP concept and discussion on the areas to be covered,
17 Aug 2016	Ministry of Energy GENERATION WORKING GROUP	See list of participants 2	• Discussion of the Government's Priority On-Grid Generation Projects
18 Aug 2016	Ministry of Energy OFF-GRID WORKING GROUP	See list of participants 3	• Discussion of the Government's Priority Off-Grid Generation Projects
18 Aug 2016	Ministry of Energy T & D WORKING GROUP 26 Brook St. 14:00		• Discussion of the Government's Priority Transmission and Distribution Projects
18 Aug 2016	GOVERNANCE WORKING GROUP 12 Pultney St. 16:00		• Discussion of the Governance Issue in Energy Project Development
23/3/2017	EUD	David Monticelli	• Discussion of EU developed mini-grids, difficulty with tariff setting of Energy and Water Regulatory Commission
23/3/2017	SOBA	Kim Beevers	• Discussion of SOBA support (from DFID) to the private sector, including REASL and individual cos.
23/3/2017	Teleficient	Ishmail Turay	• Teleficient does installation of small-scale PV systems
23/3/2017	Easy Solar	Alexandre Tourre	• Easy Solar does promotion of PV systems in rural areas
24/3/2017	WestWind	Tapsir N'jai	• Westwind Energy – looking to expand 2nd generation improved cook stove business to neighboring countries

24/3/2017	Swewa	Kofie Macauley	• 25 MW Betmai Hydro near Makeni, in negotiations for PPA
24/3/2017	ENDEV	Hartlieb Euler	• Discussion of ENDEV's knowledge of government, school, church customers for building clean energy systems and need to identify funding sources.
27/3/2017	Makeni U. Sustainable Development MBA	Fr. Joseph Turay, Peter Lansana	• Identification of clean energy entrepreneurs, discussion of clean energy opportunities in epidemic health surveillance network.
28/3/2017	Chinese Embassy, Economic and Comm. Section	Zhang Long, 3rd secretary	• Bankasoka 2.2 MW hydro, Makali 120kW hydro, Charlotte 2.2 MW hydro, completed, but GoSL would not allow GoC to construct T&D
28/3/2017	EUD	D. Kivumbi	• Continuation of 23 March discussion, specifically on issue of operating minigrids, Liberia EUD plans, opportunities for EUD to support clean energy in 2018
29/3/2017	Masada Waste to Energy/Power for All	Ami Dumbuya	• Masada is concessionaire for waste pick up in Freetown, issues of payment, aspires through Masada to do W-t-E plants. As Campaign Director of Power for All, Aminatta discussed the Call for Action, work with micro finance entities on solar systems
29/3/2017	Riverblade	Donald Keus	• Keus presented a program under development for 50 MW small hydro, already surveyed, to be done in 20 and 30 MW phases. He is negotiated PPA for 15 MW. He is also seeking funding to repair 250kW system in Yele, as PowerNed.
29/3/2017	UNOPS	Nick Gardner	• Discussion of energization program for 90 health posts, solar and solar/diesel hybrids, with the latter to comprise distcos. Questions of sustainability
	MoE	Wuseni	• Meeting at MoE was not done due to absence of Wuseni. He referred us to his deputy who was not present
30/3/2017	BBox	Wordsworth Cole	• A franchisee self-contained solar-in-a-box system for rural areas
30/3-2017	Solar Era/Renewable Energy Association of Sierra Leone	Sophie Johnson	• Ms. Johnson's Company, Solar Era has a PPA for 25M grid-connected PV that she is attempting to bring to financial close. As President of the Renewable Energy Assn. of Sierra Leone she has been involved in securing tax exemptions for solar imports.
31/3/2017	Kofie Macauley		• Discussed financing issues for 25 MW Betmai Hydro near Makeni, in negotiations for PPA

4.3 Annex 3: Documents consulted by the TAF

Action Agenda, SE4ALL, July, 2015

Agenda for Change: Second Poverty Reduction Strategy (PRSP II) 2008-2012, July, 2009.
http://www.sl.undp.org/content/dam/sierraleone/docs/frameworkdocuments/agenda_for_change.pdf

Business Climate in Sierra Leone – 2016, US Department of State
http://www.state.gov/e/eb/rls/othr/ics/investmentclimatestatements/index,htm?year=2016&dlid=254241#wrapper

Ease of Doing Business in Sierra Leone, World Bank
http://www.doingbusiness.org/data/exploreeconomies/sierra-leone/ - protecting-minority-investors

National Energy Policy and Strategy – *Energy for Poverty Alleviation and Socio-Economic Development,* GoSL, Ministry of Energy and Water Resources, August, 2009,
http://www.energy.gov.sl/NATIONAL ENERGY POLICY.pdf

Sierra Leone Investment Climate Statement 2015, US, Department of State,
https://www.state.gov/documents/organization/241947.pdf

Sierra Leone - Joint IDA-IMF staff advisory note on the third poverty reduction strategy, December, 2013
http://documents.worldbank.org/curated/en/462961468336616141/Sierra-Leone-Joint-IDA-IMF-staff-advisory-note-on-the-third-poverty-reduction-strategy)

Sierra Leone, World Bank Data, 2014
http://data.worldbank.org/country/sierra-leone

Sierra Leone's Third Generation Poverty Reduction Strategy Paper (2013 – 2018), Government of Sierra Leone, July, 2013
http://www.sierra-leone.org/Agenda 4 Prosperity.pdf

National Electricity Act (NEA), 2011,
http://www.energy.gov.sl/National%20Electricity%20Act.pdf

Sierra Leone National Energy Strategic Plan, Government of Sierra Leone, Ministry of Energy, September, 2009,
http://www.ecowrex.org/system/files/repository/2009_energy_strategic_plan_-_min_ener.pdf

Sierra Leone's Intended Nationally Determined Contribution (INDC), Environment Protection Agency, September, 2015,
https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8 -q=SIERRA+LEONE+INDC.docx

National Adaptation programme of Action (NAPA)
GoSL Ministry of Transport and Aviation National Adaptation
http://www.adaptation-undp.org/sites/default/files/downloads/sierra_leone_napa.pdf

Unleashing the Talent of Our People - A Vision and a Promise:
Private Sector Development Strategy for Sierra Leone, GoSL Ministry of Trade and Industry, March, 2009,
http://www.value-chains.org/dyn/bds/docs/724/PrivateSectorDevelopmentStrategyforSierraLeone.pdf