



## **Ministry of Energy**

# **GOVERNMENT OF SIERRA LEONE**

## **REQUEST FOR EXPRESSION OF INTEREST (REOI)**

### **Solar mini-grid operation in Sierra Leone under a Public-Private Partnership arrangement**

**Ref #: SL/REOI/2017-001**

#### **1. Introduction**

The Government of Sierra Leone through its Agent, the Ministry of Energy has developed a strategy for active participation and involvement of the private sector in the operation and maintenance of solar mini-grid systems through Public-Private Partnership arrangements. In this regard, the Government now invites Expressions of Interest from qualified and reputable Solar PV Operators for the operation and maintenance of its solar mini-grid infrastructure (existing and new assets) via a Public-Private Partnership Model.

#### **2. Background**

The Rural Renewable Electrification Project (RREP) implemented by the United Nations Office for Project Services (UNOPS) and grant funded by the UK's Department for International Development (DFID) (scope: ca. USD 44m) is procuring, constructing and installing solar-battery power supply systems for 54 Community Health Centres (CHCs) across Sierra Leone. These 6 kW<sub>p</sub> PV systems will be installed and commissioned by July 2017. 50 of these systems will be extended to mini-grids by adding 10 kW<sub>p</sub>, 20 kW<sub>p</sub> or 30 kW<sub>p</sub> of solar PV capacity and connecting customers through low voltage distribution networks by the end of 2017. All of the required procurement, construction, installation and commissioning is funded by DFID and implemented by UNOPS. Private companies or NGOs are invited to express their interest in the long-term technical and commercial operation of the 50 mini-grids and 4 stand-alone PV solar systems (providing relevant services such as technical O&M, management, customer connection, electricity sales, revenue collection, component replacement, system extension, monitoring, evaluation and reporting), and in the supply of metering technology adequate to their applied business models.

In an additional minimum number of 40 larger villages (with populations of 3,000 to 15,000 per village), the RREP will fund and install electricity distribution networks. Private sector operators are expected to finance, construct, install and commission power generation assets with a renewable fraction of at least 50%. According to preliminary estimates, each of these systems will require 50 kW to 300 kW of installed power generation capacity. The private sector company or NGO will be in charge of long-term technical and commercial operation of all power generation and distribution assets with the aim to generate revenues from electricity sales to the communities.

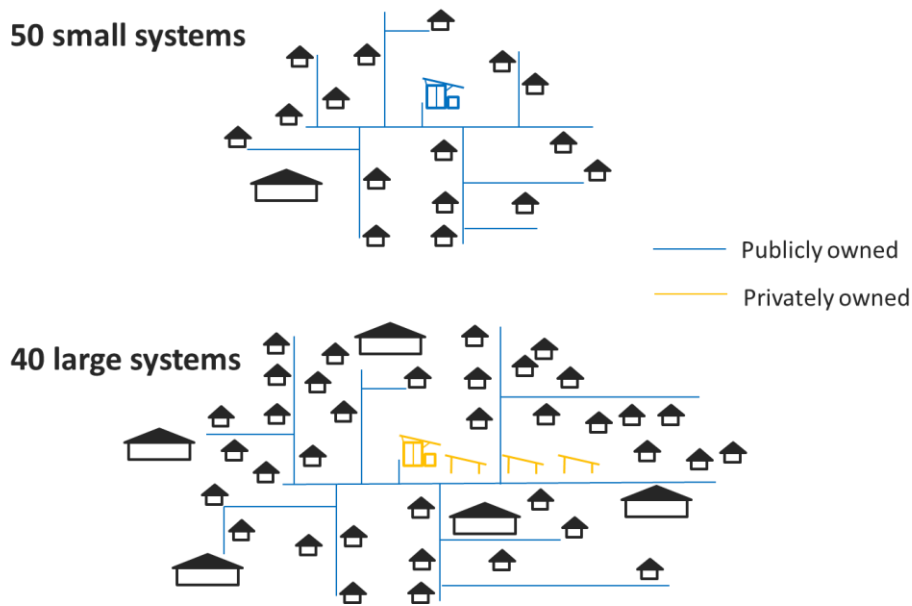


Figure 1: Split of assets into publicly (government) and privately (operator) owned assets

The ownership of all assets procured for, constructed and installed using DFID funds will be transferred to the Ministry of Energy, which will sign an unlimited usage right contract with the private operator. The operator will pay a small annual fee to the Government of Sierra Leone (GoSL) for the management of the contract and related monitoring tasks. The magnitude of the fee to be paid is expected to be defined by July 2017. This structure follows the rules of the “Public-Private Partnership Act, 2010”, the “Sierra Leone Small and Medium Enterprises Development Agency Act, 2015”, the “Sierra Leone Local Content Agency Act, 2016” and all other relevant laws. Under the RREP, UNOPS will support the GoSL in performing its tasks until mid-2020.

In parallel, UNOPS is working closely with the Electricity and Water Regulatory Commission (EWRC) to set up regulations that protect the private operators from commercial losses resulting from the connection of the national grid to the mini-grid. The regulation shall also set the rules for mini-grid tariff definition. The aim is to get the regulation approved before the commencement of operation of the first mini-grids at the end of 2017.

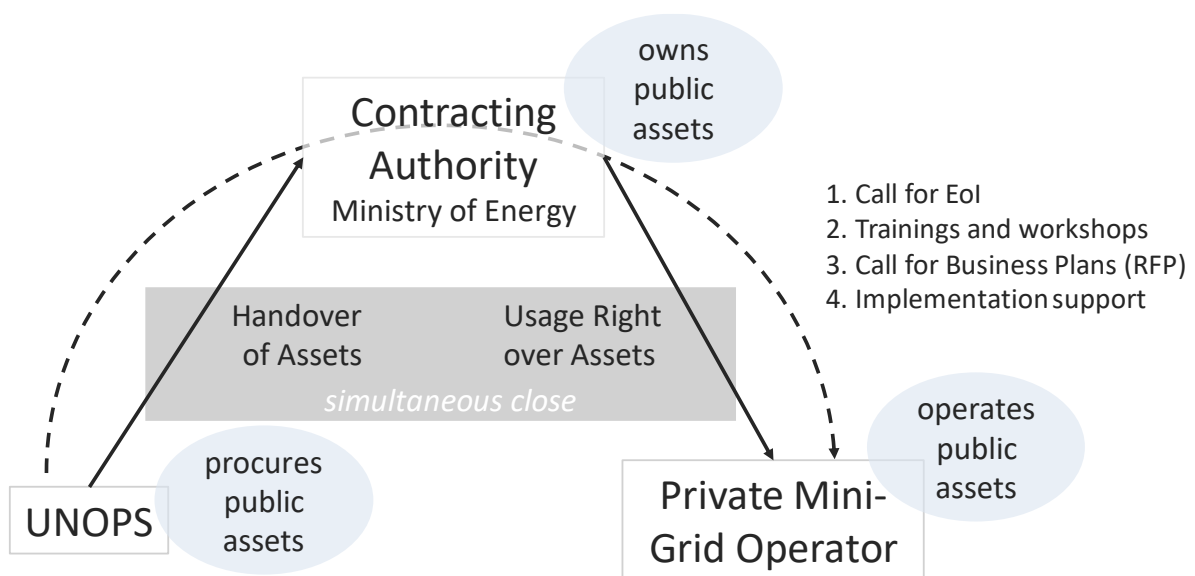


Figure 2: Ownership transfer structure of publicly owned assets

Within the RREP period until mid-2020, UNOPS will support mini-grid developers and operators through the GoSL with the following services, where required by the private partner of the PPP, involving international mini-grid experts:

1. For operators of the 50 mainly grant funded mini-grids (Public Contribution Level 2\*) and the 4 stand-alone systems (Public Contribution Level 3\*):
  - a. Definition of the operational/business and community involvement strategy adjusted to organizational structures and local environment
  - b. Financial Modelling
  - c. Selection of adequate metering technology
  - d. Implementation of the operational strategy
  - e. Continuous improvement of the operational strategy
  
2. For developers/operators of the min. 40 larger systems requiring private investment into the generation assets (Public Contribution Level 1\*)
  - a. Demand assessments and demand projections
  - b. Definition of the operational/business and community involvement strategy adjusted to organizational structures and local environment
  - c. Power generation component sizing and system design through computer simulations
  - d. Financial Modelling
  - e. Acquisition of finance
  - f. Preparing the Bill of Quantities (BOQ) for all power station components and material
  - g. Design and management of all civil works required
  - h. Acquisition of regulatory and administrative approvals like land acquisition, building permission, environmental clearance, licensing, tariff approval (in compliance with respective laws and regulations)
  - i. Import procedures and if applicable organization of import tax and duty exemptions
  - j. Management of local logistics
  - k. Management of construction and installation tasks
  - l. Commissioning
  - m. Management of operational tasks

All activities shall be carried out in close cooperation between the private mini-grid operator and the Ministry of Energy/UNOPS.

### **3. Proposed Scope of Development**

The preferred solution is a sustainable renewable energy mini-grid operation system. The choice of solar PV technology for the first 50 systems of this project is based on the long-term outlook for the sake of the environment and the future budgetary impacts.

The winning solution is one that will be comprehensive in its approach to initially delivering the required assets, if any, operating them for consistent and quality service, and maintaining them through to their full life (i.e. an Maximum Asset & Service Lifecycle approach). Consequently, this is expected to at least include the following:

- a) Operating, maintaining, financing, installing/refurbishing of the required assets by the private partner.
- b) Ongoing operation and maintenance by the same private partner, with the possibility of generating complementary revenue streams to support operations and maintenance activities.
- c) Renewable power plants to serve as the substantive or sole power source.

#### 4. Requirement from Interested Parties

In order to be pre-qualified, prospective private partners/consortia must possess the requisite capabilities and relevant experience in the provision of the required services. They are expected to submit comprehensive information that contains:

- Full name and Nationality (country of registration) of the Company and contact person, postal address, telephone, e-mail address and web site URL (if any);
- Brief description of the history and business of the respondent;
- Ownership structure including name(s) of shareholders, percentage shareholdings, intermediate and ultimate holding company or beneficial owner
- Company registration including Certificate of Incorporation, certified true copies of Memorandum and Articles of Association;
- Most recent 3-Years Audited Financial Statements and latest Management Accounts if available;
- Evidence of financial capacity to deliver the project as contemplated;
- Evidence of previous experience and expertise in providing the required services locally and/or internationally including experience in PPP Initiatives where applicable. This should include the following details:
  - Name of Project, Brief Description and Client(s);
  - Scope of work, Role, Contract Value, Nature of Contract (PPP, Lump Sum etc) and Contractual Period;
  - Name and address of related client's referee;
  - Experience with delivery, operation and maintenance of solar based infrastructure (streetlight or otherwise).
- For those systems which are subject to private sector investments into the generation assets, any type of generation technology that incorporates at least 50% of renewable fraction is eligible. Any of the following resources are considered renewable: Solar, hydro, wind, biomass, geothermal, wave, and waste.

In addition to the details above, each submission must be accompanied by:

- a. Transmittal Letter,
- b. Cover/Title Page,
- c. Table of Contents; and
- d. Executive Summary.

#### 5. Tentative Timeline of the selection process

Publication of Call for EoI	24.05.2017
Deadline for Questions about EoI	20.06.2017
Deadline for reception of EoIs by GoSL	27.06.2017 12:00 PM GMT
Invitation to submit a Business Plan (RFP) and notification of unsuccessful applicants	10.07.2017
Pre-bid Conference: bidders conference with matchmaking event (giving bidders the opportunity to create consortia) in Freetown for entities planning to submit a Business Plan	24. – 26.07.2017
Deadline for Questions about the Invitation to submit Business Plans (RFP)	28.07.2017
Deadline for reception of Business Plans by GoSL	15.09.2017 12:00 PM GMT
Notification of successful and unsuccessful bids and start of collaboration between GOSL/UNOPS and the successful bidders	10.10.2017

6. Submission of Expression of Interest

All Eoi (in English) submission should be in accordance with the following instruction.

One (1) Original and two copies of Expression of interest to be delivered in a sealed envelope marked 'EOI- Solar-mini grid' and delivered to the address below. Electronic submission in PDF format not exceeding 5 MB should be sent to the Transaction Adviser at: [ghoh.bids@unops.org](mailto:ghoh.bids@unops.org). **The EOI must be submitted no later than 27.06.2017 between the hours of 9am to 12 noon.**

**The Permanent Secretary  
Ministry of Energy  
Stronge Tower  
3 & 3A Pademba Road  
Freetown  
Sierra Leone**

7. Contact for requests for clarifications

All requests for clarifications in relation to this REOI shall be sent to:

[KingsleyM@unops.org](mailto:KingsleyM@unops.org)

**ATTENTION: This email address is for ONLY clarification**

Table 1: Survey of sites, Public Contribution Level, customers and technologies

The following table shows the sites that have selected by the GoSL for stand-alone solar PV systems (4 sites - #73-76), fully grant financed small mini-grids (50 sites – #1-50), and partly grant financed larger mini-grids (22 sites - #51-72). The list of larger mini-grids will be extended to at least 40 sites.

#	Public Contribution Level*2	Project Village ID	Location			Coordinates		Generation**					Distrib.***			Customers***				
			District Name	Chiefdom	Hospital Name	Latitude	Longitude	System Class	solar PV [kWp]	Solar Inverter [kW]	Battery Size [kWh C10]	Batter Inverter [kVA]	3 phase [km]	1 phase [km]	poles	TOTAL	Domestic	Commercial	Productive	Public
1	2	2	Moyamba	Upper Banta	Mokelleh CHC	7.716889	-12.1644	1	16	16	80	12	0.4	0.7	29	37	25	4	0	8
2	2	3	Moyamba	Timidale	Bomotoke CHC	7.81714	-12.6558	1	16	16	80	12	0.8	0.8	40	56	45	3	1	7
3	2	5	Bombali	Sella Limba	Kathantha Yimboi CHC	9.545769	-12.1704	1	16	16	80	12	0.4	1.1	36	47	39	3	0	5
4	2	6	Kono	Lei	Kombayendeh CHC	8.786712	-10.7082	2	26	26	160	18	1.2	2.8	112	106	89	8	3	6
5	2	7	Bombali	Libeisaygahun	Batkanu CHC	9.075351	-12.4157	1	16	16	80	12	1.0	3.2	98	73	55	8	0	10
6	2	8	Bombali	Magbaimba Ndowahur	Kagbere CHC	9.220258	-12.1403	1	16	16	80	12	1.2	1.7	68	45	28	9	1	7
7	2	11	Pujehun	Mano Sakrim	Mano Gbongeima CHC	7.15505	-11.7556	1	16	16	80	12	0.3	0.4	24	46	35	4	0	7
8	2	12	Kambia	Gbiledixin	Gbalamuya CHC	9.216988	-12.9193	1	16	16	80	12	0.7	1.7	58	52	39	4	0	9
9	2	13	Bonthe	Bum	Madina CHC	7.46391	-11.9488	2	26	26	160	18	0.8	1.9	80	68	47	10	3	8
10	2	14	Moyamba	Kargboro	Shenge CHC	7.911424	-12.954	2	26	26	160	18	1.5	3.5	142	77	65	3	2	7
11	2	17	Kono	Gbane Kandor	Kaodu CHC	8.615148	-10.5829	1	16	16	80	12	0.7	1.0	45	52	41	2	2	7
12	2	18	Port Loko	Sanda Magbolonthor	Sendugu CHC	9.069161	-12.6306	1	16	16	80	12	0.5	1.2	49	41	30	4	1	6
13	2	20	Moyamba	Kowa	Njama CHC	8.082406	-11.9417	2	26	26	160	18	1.4	2.6	104	150	130	6	3	11
14	2	22	Kambia	Samu	Kychom CHC	8.928292	-13.1437	3	36	36	160	36	1.8	3.9	153	155	115	23	8	9
15	2	24	Bonthe	Nongba Bullom	Gbap CHC	7.377403	-12.2614	1	16	16	80	12	0.5	1.3	51	47	39	2	1	5
16	2	25	Port Loko	Buya Romende	Kamasondo CHC	8.862203	-12.5127	2	26	26	160	18	0.8	1.2	57	60	46	6	2	6
17	2	27	Bombali	Gbanti Kamaranka	Kamaranka CHC	9.297616	-12.2062	1	16	16	80	12	0.9	2.1	89	75	53	13	0	9
18	2	28	Kambia	Tonko Limba	Kamasasa CHC	9.394833	-12.5455	2	26	26	160	18	1.3	3.2	112	120	104	5	4	7
19	2	29	Kailahun	Yawei	Bandajuma CHC	8.309933	-10.8483	2	26	26	160	18	0.9	2.2	98	76	59	4	3	10
20	2	31	Tonkolili	Lalali Mara	Mara CHC	8.662892	-12.2456	2	26	26	160	18	0.8	2.0	86	99	87	6	0	6
21	2	32	Port Loko	Masimera	Masimera CHC	8.644446	-12.4498	2	26	26	160	18	0.7	1.2	56	42	16	7	6	13
22	2	33	Pujehun	Pejewa	Futa Pejeh CHC	7.561143	-11.5741	1	16	16	80	12	0.3	1.1	35	46	39	2	0	5
23	2	34	Moyamba	Kamajei	Senehun CHC	8.169804	-11.9486	2	26	26	160	18	1.4	3.1	123	101	87	5	0	9
24	2	35	Moyamba	Kongbora	Bauya CHC	8.187967	-12.5732	2	26	26	160	18	2.4	4.4	176	99	82	4	2	11
25	2	37	Port Loko	Kaffu Bullom	Conakry Dee CHC	8.697839	-13.2377	3	36	36	160	36	0.6	1.7	75	201	167	23	3	8
26	2	42	Bombali	Bombali Shebora	Rokonta CHC	8.746551	-12.0492	1	16	16	80	12	0.8	1.7	74	66	55	4	1	6
27	2	43	Tonkolili	Kholifa Mabang	Mabang CHC	8.567137	-12.1734	1	16	16	80	12	0.3	1.2	44	49	39	3	0	7
28	2	44	Moyamba	Kaiyamba	Kangahun CHC	8.083206	-12.2864	3	36	36	160	36	1.1	2.3	90	116	93	10	5	8
29	2	46	Bombali	Tambaka	Fintonia CHC	9.672926	-12.2259	2	26	26	160	18	0.8	1.6	69	80	60	14	1	5
30	2	48	Kono	Sandor	Kayima CHC	8.89046	-11.1599	3	36	36	160	36	1.6	3.3	128	161	133	7	7	14
31	2	50	Kailahun	Kissi Kama	Dia CHC	8.384737	-10.4092	2	26	26	160	18	0.9	3.3	111	119	95	5	2	17
32	2	53	Pujehun	Sowa	Bandajuma Sowa CHC	7.572287	-11.652	2	26	26	160	18	1.1	3.3	114	138	118	9	1	10
33	2	59	Port Loko	Loko Masama	Petifu CHC	8.695258	-13.1079	2	26	26	160	18	1.7	6.0	218	115	98	9	0	8
34	2	60	Kambia	Masungbala	Baimoi Munu	9.092013	-12.75	2	26	26	160	18	0.8	2.7	103	83	69	8	0	6
35	2	65	Koinadugu	Folosaba Dembelia	Musaia CHC	9.7551	-11.5702	2	26	26	160	18	1.4	1.4	74	93	71	12	3	7
36	2	68	Moyamba	Ribbi	Bradford CHC	8.295322	-12.7463	3	36	36	160	36	1.5	3.6	134	162	141	7	6	8
37	2	70	Kono	Soa	Kaikordu CHC	8.617153	-10.7208	2	26	26	160	18	0.6	1.3	50	86	54	23	2	7
38	2	75	Bonthe	Sogbini	Tihun CHC	7.566219	-12.0896	2	26	26	160	18	1.3	2.4	94	118	94	14	2	8
39	2	80	Kono	Fiama	Jagwema CHC	8.627837	-10.8233	2	26	26	160	18	1.4	3.3	118	101	86	4	2	9
40	2	87	Koinadugu	Niene	Yiffin CHC	9.122942	-11.2696	3	36	36	160	36	1.6	4.2	147	192	161	12	7	12
41	2	94	Kailahun	Penguia	Sanduru CHC	8.395037	-10.7068	3	36	36	160	36	0.9	2.8	92	169	142	7	4	16
42	2	95	Kono	Kamara	Tombodu CHC	8.70203	-11.012	3	36	36	160	36	1.4	3.7	132	158	130	11	3	14
43	2	97	Port Loko	TMS	Malekuray CHC	8.802195	-12.6397	2	26	26	160	18	1.5	4.3	149	80	64	5	2	9
44	2	21	Bo	Bumpe Ngawo	Bumpeh C H C	7.889492	-11.9033	3	36	36	160	36	2.3	4.6	174	194	164	8	4	18
45	2	30	Moyamba	Dasse	Mano Dasse CHC	8.040625	-12.089	2	26	26	160	18	1.8	2.8	132	148	125	6	3	14
46	2	98	Moyamba	Lower Banta	Gbangbatoke CHC	8.000553	-12.481	3	36	36	160	36	0.6	3.2	100	93	36	26	8	23
47	2	36	Moyamba	Bagruwa	Sembehun CHC	7.9405	-12.542	3	36	36	160	36	1.8	3.5	122	169	142	7	4	16
48	2	55	Koinadugu	Dembelia Sinkunia	Sinkunia CHC	9.86069	-11.4308	3	36	36	160	36	1.7	2.2	104	174	147	7	4	16
49	2	56	Kono	Gbane	Gandorhun CHC	8.436628	-10.8666	3	36	36	160	36	3.5	3.4	172	174	147	7	4	16
50	2	69	Koinadugu	Wara Wara Bafordia	Bafordia CHC	9.684135	-11.7317	3	36	36	160	36	1.3	2.4	95	152	128	6	4	14

51	1	57	Bo	Bagbao	Jimi Bagbor CHC	7.606513	-11.816	3	36	36	200	36	evaluation to be completed
52	1	39	Bo	Lugbu	Sumbuya CHC	7.65242	-11.9641	3	36	36	200	36	evaluation to be completed
53	1	52	Bo	Tikonko	Tikonko CHC	7.878265	-11.7815	3	36	36	200	36	evaluation to be completed
54	1	4	Bo	Jaiama Bongor	Koribondu CHC	7.711258	-11.6937	4	46	46	240	54	evaluation to be completed
55	1	51	Bonthe	Jong	Mattru CHC	7.605252	-12.1738	5	indiv.	analysis requ.			evaluation to be completed
56	1	38	Bonthe	Imperi	Moriba Town CHC	7.788282	-12.3047	5	indiv.	analysis requ.			evaluation to be completed
57	1	47	Kailahun	Dea	Baiwalla CHC	7.99562	-10.6477	3	36	36	200	36	evaluation to be completed
58	1	58	Kailahun	Mandu	Mobai CHC	7.992463	-10.753	3	36	36	200	36	evaluation to be completed
59	1	88	Kailahun	Malema	Jojoima CHC	7.876699	-10.7872	4	46	46	240	54	evaluation to be completed
60	1	41	Kailahun	Peje Bongai	Manowa CHC	8.169637	-10.7515	4	46	46	240	54	evaluation to be completed
61	1	23	Kailahun	Kissi Tongi	Buedu CHC	8.27564	-10.3721	5	indiv.	analysis requ.			evaluation to be completed
62	1	78	Kailahun	Peje West	Bunumbu CHC	8.164599	-10.8519	5	indiv.	analysis requ.			evaluation to be completed
63	1	92	Kailahun	Kissi Teng	Koindu CHC	8.461588	-10.3392	5	indiv.	analysis requ.			evaluation to be completed
64	1	93	Kailahun	Jawei	Daru CHC	7.990524	-10.844	5	indiv.	analysis requ.			evaluation to be completed
65	1	89	Kailahun	Luawa	Luawa Under five CHC	8.275611	-10.5738	5	indiv.	analysis requ.			evaluation to be completed
66	1	85	Kailahun	Njaluahun	Segbwema CHC	8.002708	-10.9481	5	indiv.	analysis requ.			evaluation to be completed
67	1	86	Kambia	Magbema	Rokupr CHC	9.01666	-12.9444	5	indiv.	analysis requ.			evaluation to be completed
68	1	76	Kenema	Simbaru	Gbojibu CHC	8.191258	-11.3397	5	indiv.	analysis requ.			evaluation to be completed
69	1	96	Moyamba	Fakunya	Moyamba Junction CHC	8.326558	-12.2163	4	46	46	240	54	evaluation to be completed
70	1	54	Moyamba	Kori	Taiama CHC	8.193302	-12.0613	4	46	46	240	54	evaluation to be completed
71	1	82	Moyamba	Bumpeh	Hatfield Rotifunk CHC	8.228588	-12.6776	5	indiv.	analysis requ.			evaluation to be completed
72	1	64	Port Loko	Koya	Masiaka CHC	8.4921	-12.7499	5	indiv.	analysis requ.			evaluation to be completed
73	3	81	Kambia	Mambolo	Mambolo CHC	8.906717	-13.0286	0	6	DC	47	5	no distribution network
74	3	61	Kenema	Kandu Lekpeama	Levuma CHC	7.966879	-11.3196	0	6	DC	47	5	no distribution network
75	3	40	Koinadugu	Sengbe	Koinadugu 2 CHC	9.530177	-11.3677	0	6	DC	47	5	no distribution network
76	3	72	Kambia	Bramaia	Kukuna CHC	9.38853	-12.6701	0	6	DC	47	5	no distribution network

\* The sites are divided into three different Public Contribution Levels:

**Public Contribution Level 3** comprises 4 stand-alone systems supplying CHCs that have excess electricity supply capacity and can be used for energy kiosk business or other commercial business models. At these sites, the village is too far from the CHC to be connected to the system. The private operator will receive a usage right over the assets with the obligation to operate and maintain the overall power supply system.

**Public Contribution Level 2** comprises 50 mini-grids supplying to villages through low voltage distribution networks and customer connections which are part of the public contribution. The private operators are expected to invest into, procure, install and commission a metering system of their choice. The private operators will receive a usage right over the assets falling under the public contribution with the obligation to operate and maintain the overall power supply system.

**Public Contribution Level 1** comprises medium and low voltage distribution networks for at least 40 sites as public contribution out of which 22 are mentioned in the table above. The private operators are expected to invest into, procure, install and commission generation assets with a renewable fraction of minimum 50%, and metering assets of their choice. The private operators will receive a usage right over the Public assets falling under the public contribution with the obligation to operate and maintain the overall power supply system and supply up to a certain number of kWh per month and up to a certain power bandwidth to the CHC free of charge.

\*\* Generation systems of Public Contribution Level 3 comprise Victron Phoenix Inverter 48/5000, Sunlight 2V RES OPzV batteries and Victron Blue Solar MPPT charge controllers as public contributions. Generation systems of Public Contribution Level 2 comprise SMA Sunny Island 8.0H battery inverters, SMA Sunny Boy and Sunny Tripower solar inverters and Sunlight 2V RES OPzV batteries as public contributions. Generation systems of Public Contribution Level 1 need to be designed in cooperation between the private partner and GoSL, procured for and financed by the private partner; suggested system sizes for some sites can be found in the

table as grey figures. Additional potential sites of Public Contribution Level 1 will be published with the Call for Business Plans. ALL NUMBERS ARE INDICATIVE AND SUBJECT TO CHANGE UNTIL PPP CONTRACT SIGNING.

\*\*\* Systems of classes 1 and 2 have single phase generation systems. For initial connection, in system classes 1 and 2, the four conductors (L1, L2, L3, N) of the three phase distribution lines installed will be combined to become L and N of one single phase distribution system. In case of the private operator increasing the capacity of the generation system, the distribution network can be re-configured to become a three-phase system. Systems of class 3 and larger have three phase generation systems and three phase distribution lines with single phase extensions. ALL NUMBERS ARE SUBJECT TO CHANGE UNTIL PPP CONTRACT SIGNING.

\*\*\*\* A customer evaluation has been conducted during initial site visits. For Public Contribution Level 2 sites, during a second detailed demand assessment, interviews were conducted with households and businesses. All information is meant to be indicative and is subject to on-site verification by the applicant.