Annex 2

Scope of Work - LOT 2:
Sierra Leone Integrated Energy and
COVID-19 Vaccine Distribution Plans

December 14, 2020

Contents

1. Context

1.1 Electricity Sector

Sierra Leone has one of the lowest electricity access rates in the world: approximately 26% of the country's population has access to electricity. Its power sector is small, with just less than 200 MW of on-grid operational capacity. The electricity sector faces challenges with seasonal availability of hydropower and dilapidated power infrastructure; both of which contribute to unreliable power supply and substantial 'back-up' power. It is estimated that there are currently 35,000 diesel generators in use which amount to approximately 180MW of installed capacity. Additionally, even though electricity tariffs are highly subsidized, they remain among the highest on the continent at a rate of 28 cUSD/kWh. The country possesses vast potential in renewable energy in the form of biomass from agricultural wastes, hydro and solar power, which remain largely untapped.

In Sierra Leone, rural electrification is the responsibility of the Renewable Energy Unit within the Ministry of Energy. In the past decade, the government of Sierra Leone introduced several institutional and policy reforms to transform its electricity sector. The Electricity Act, adopted in 2011, separated the formerly monopolistic National Power Authority into two state-owned utilities: the Electricity Generation and Transmission Company and Electricity Distribution and Supply Authority and provided the basis for the liberalization of the electricity market by enabling the development of Independent Power Producer projects. Other relevant policy and strategy documents include the National Renewable Energy Action Plan (2015) and the National Renewable Energy Policy (2016), both of which aim to increase access to electricity to 82% and double renewable energy in the energy mix by 2030. Sierra Leone also has an Electricity Sector Reform Roadmap (2017-2030), which is the latest planning document for the power sector in the country. The Roadmap was recently updated by the Integrated Resource Plan 2019 – 2023. The Resource Plan is based on a least-cost electricity supply and demand analysis for electric on-grid system and customers.

1.2 Cooking Sector

According to the 2018 Sierra Leone Integrated Household Survey (SLIHS), approximately 72% of households use firewood as their main cooking fuel, 28% use charcoal, 0.2% use gas, and 0.1% use animal waste. Roughly 1% of the population has access to clean fuels and technologies for cooking in Sierra Leone (2016)[1]. The consumption of fuelwood is worsened by the widespread use of inefficient cooking methods, the most common of which is an open "3-stone-fire". The rate of consumption of fuelwood far exceeds the replenishing rate to such an extent that dessert encroachment, soil erosion and loss of soil fertility are now serious problems in the country.

1.3 COVID-19

Sierra Leone was the last country in the Mano River Union to register a positive case of COVID-19 virus at the end of March 2020. Based on lessons learned from the Ebola outbreak in 2014/2015, the President declared a twelve-month long state of public health emergency and the government implemented a proactive strategy COVID-19 Health Preparedness and Response Plan, which has kept the number of infections low compared to many other countries around the world.

[1] World Bank 2016

The next front in the battle against Covid-19 is vaccination. A successful vaccination programme could reconnect Sierra Leone to the rest of the continent and the world, while enabling the reorganization of the country's health systems. With several vaccines nearing approval, attention is rapidly turning to how they will be distributed. Cold-chain will be critical in rapidly transporting and delivering COVID-19 vaccines to all communities, particularly in rural areas where electricity supply and cooling infrastructure is often non-existent or unreliable.

Given the country's dispersed population, the abundance of renewable energy resources and the cross-border inter-connection opportunities, Sierra Leone can embark on an aggressive electrification campaign based on both grid and off-grid options. An integrated approach is equally important to advancing Sierra Leone's clean cooking sector. In response, SEforALL, in support of the Government of Sierra, seeks to develop an Integrated Energy Plan as a fully open-access tool that can be used by a range of public and private sector actors in determining the optimal way of achieving universal energy access (electrification and cooking). At the same time, SEforALL seeks to provide critical decision-making support for the Government of Sierra Leone in determining the appropriate approach to roll out the COVID-19 vaccine to the most vulnerable populations.

2. Objectives

The overall objective of this assignment is twofold: First, to develop a national Integrated Energy Plan for Sierra Leone. Second, building on the latest available geospatial datasets and analysis, to build a model to help the Government of Sierra Leone understand the tradeoffs associated with different approaches for distributing the COVID-19 vaccine. Specifically, SEforALL seeks an organization or a consortium of organizations to:

1. Deliver an Integrated Energy Plan by:

    a) Conducting a geospatial electrification analysis that identifies the optimal route to achieving universal electrification in Sierra Leone through grid densification, extension, mini-grids and off-grid solutions. The analysis should also provide insights into the costs associated with achieving universal electrification, including any affordability gaps.
    b) Developing a geospatial clean cooking model that integrates and analyzes geospatial datasets related to clean cooking services, allow data-driven planning, coordination and decision-making to support the uptake and adoption of modern energy cooking services (MECS) throughout the country.
    c) Ensuring the Integrated Energy Plan (electrification and cooking) and its underlying tools and data are well understood by key stakeholders in the public and the private sectors and can inform policy and organizational decision-making. The Organization/Consortium shall also build the capacity of key government stakeholders around the technical aspects of the tools and their future maintenance and use.
    d) Ensuring the Integrated Energy Plan is publicly accessible and usable by external stakeholders through an online, interactive spatial platform. In particular, one of the main aims of an accessible platform is to ensure that private sector actors and investors have access to the Integrated Energy Plan, and that the tools (i.e. the geospatial models) are structured in a way as to be as useful as possible to these actors.

2. Develop a geospatial model to help the Government of Sierra Leone evaluate the trade-offs of different approaches for rolling out a COVID-19 vaccine, considering the constraints and opportunities around cold chain storage and transportation and their associated costs. This will help to ensure that sufficient planning and budgeting is put in place in advance, to help prepare for the actual arrival of the vaccine.

For the government of Sierra Leone, the benefits of this project are apparent. The project will generate important insights into: (1) the location of unelectrified populations and the optimal / least-cost approach and ideal technology mix for achieving universal electrification (e.g. solar home systems and mini-grids for off-grid; grid extension for on-grid); and (2) the investment requirements for achieving universal electrification, including any affordability gaps. In addition to these two dimensions, there will be a series of analysis and findings on: (3) clean cooking, particularly around the opportunity, feasibility and implications for expanding different forms of modern cooking energy services (MECS); and (4) the costs associated with delivering these different clean cooking solutions at different scales. The geospatial datasets from the Integrated Energy model will then form the basis for determining the cooling and energy needs and costs associated with establishing and maintaining cold chain infrastructure for the delivery of a future COVID-19 vaccine.

For the private sector, the benefits will be focused on a significant reduction in some of their development costs. By providing high quality data and information, the private sector can make decisions in a data rich environment, which will lead to higher probability of success. In addition, Sierra Leone pursuing the development of an Integrated Energy Plan demonstrates a commitment to achieving universal energy access, which also helps excite the private sector more.

Finally, for SEforALL, in addition to helping both the government of Sierra Leone and the private sector, the overarching benefit will be to have 'model' Integrated Energy and COVID-19 Vaccine Distribution Plans that can be replicated and built on to help other countries.

3. Scope of Work

To deliver on the above stated objectives, the selected Organization/Consortium will undertake the following tasks:

Task 1: Review similar and complimentary efforts being carried out by other stakeholders in Sierra Leone to identify synergies and opportunities to leverage new data, tools, etc

The Organization/Consortium shall first carry out a comprehensive review of other recently completed, ongoing and future activities/projects relevant to this assignment (e.g. Power Africa/ MCC, CLSG WAPP, RREP, ACE TAF, World Bank). The review should identify where there may be synergies with these efforts, including opportunities to leverage new data/information, tools, relationships, etc. Upon completion of this review, the Organization/Consortium shall, in consultation with SEforALL and the Government of Sierra Leone, pursue these opportunities and synergies with the goal of leveraging them for the benefit of this assignment.

Task 2: Develop a geospatial, integrated electrification plan

The Organization/Consortium shall develop a roadmap for investment and project implementation that: (1) meets Sierra Leone's electrification targets at the least possible cost and considers any political, social, development or environmental priorities; and (2) estimates the costs of supply. The integrated electrification plan should provide, among other things, the associated cost of the investments to be made every year, as well as the costs of managing, operating and maintaining them. The plan should also contain estimates of demand to be served.

Task 2.1: Development of analysis criteria and parameters

The Organization/Consortium shall propose the key parameters that will inform/guide the analysis that follows and elaborate how each parameter will be defined and measured. Such parameters include but are not limited to: (1) service quality standards for grid networks and individual systems; (2) target access levels; and (3) temporal issues such as pace of roll-out and stop-gap solutions. The Organization/Consortium shall review and discuss with relevant counterparts as well as concerned ministries and utilities.

Task 2.2: Data collection and validation

The Organization/Consortium shall collect, clean and compile all available data relevant to this exercise.

The data layers should include, but not be limited to:

- Location data for potential beneficiaries of electrification. This should include household spatial settlement patterns (number and size of households), population density, extent of spatial nucleation across and within settlements.
- Location data for health facilities, schools, administrative buildings, water supply points and major trade/market centers.
- Location data for productive uses of electricity, including agricultural value chains and other commercial and industrial sites (e.g. mines).
- Projected electricity demand for key loads (residential, commercial, agricultural, mining and industrial). Efforts should be made to characterize demand heterogeneity and forecast latent and future demand, using on-the-ground surveys, where necessary and feasible.
- Information on energy expenditure and willingness to pay.
- Digitized representation of HV and MV networks and lines, the national grid system and its components – substation and transformer etc., and the main bulk supply delivery points – existing and planned.
- Location data of existing and/or operational mini grids, including the type of energy (wind, solar, geothermal, hydropower and biomass).
- Data on renewable energy resource availability, at each demand load center, including wind, solar, geothermal, hydropower and potential biomass from crop residue.
- Data on terrain, water bodies and road coverage and quality.
- Socio-economic data derived from both publicly available and other geospatial market intelligence shared by companies and key industry associations. This includes location data on mobile/ mobile money operators, telecom towers and financial institutions.
- Other socio-economic indicators, including poverty rates and the location of women-led households.
- Technology costs (capex and opex):

- Grid: Cost of cabling/km, transformer cost, reticulation costs, metering costs, generation costs
- Solar Home Systems: Average cost of SHS systems across a range of suppliers
- Mini-grids: Cost of batteries ($/kWh), panels ($/kW), cabling, inverter costs, O&M, etc.

All cost elements should be based on 2020/21 and may need to be obtained through developer and vendor interviews. Each assumption should be tested so it reflects as close to current reality, as possible. Costs should also be adjusted to take into account projected future cost reductions/changes and the impact of economies of scale and varying penetration rates (of particular technologies) on unit costs.

The Organization/Consortium's proposal should indicate how the Organization/Consortium plans to address technical issues such as: collection of the unavailable data, appropriateness of readily available and applicable data, with respect to validity, accuracy, quality, and level of resolution of data. The Organization/Consortium is encouraged to use publicly available data layers, whenever possible and when the data is deemed accurate and high-quality. The Organization/Consortium shall build into their cost proposal a provision for acquiring data that is deemed necessary or particularly useful to the exercise.

Task 2.3: Development of least-cost electrification options: grid, mini-grid and off-grid

The Organization/Consortium shall establish a geospatial least-cost electrification planning model that integrates on-grid and off-grid technology choices in a systematic and comprehensive manner. The model shall identify areas for grid densification, grid extension as well as off-grid access delivery modalities to serve as an effective basis for national-level planning with the aim to achieve universal access to electricity.

The model shall detail the location and clustering of demand load centers at a settlement or more detailed level and determine the most cost-effective technological approach to electrify each load center. The analysis shall consider least-cost supply and demand considerations, affordability, technical and economic viability, environmental and social protection, and the integration of renewable resources, all within a national context.

The Organization/ Consortium shall evaluate and compare least-cost electrification options for unelectrified loads via central grid (grid extension, densification or intensification), mini-grids (expansion of existing mini-grids or development of new ones) and solar home systems connections. The analysis shall determine technology unit costs for these technologies (fixed and variable costs at different scales and time horizons). The Organization/Consortium shall provide analysis for areas proposed to be connected by off-grid technologies and determine, which will be better served using mini-grids or individual SHSs.

The Organization/Consortium shall determine the associated total costs for achieving universal electrification, including any affordability gaps. The tool should be user-friendly and facilitate updating of the key input parameters.

Task 2.4: Sensitivity analysis

The Organization/Consortium shall undertake a sensitivity analysis to examine the robustness of the model's key outputs to changes in key input assumptions and policy parameters. This analysis should

examine the sensitivity of selected high-level outputs of the options analysis to different technology and supply costs, standards for service, reliability and resilience, timing of roll-out and other policy variables.

The Organization/Consortium shall also discuss preliminary results with the Government of Sierra Leone and SEforALL for discussion and revision and incorporate feedback into the sensitivity analysis and final least-cost electrification options analysis.

Task 3: Carry out a geospatial clean cooking analysis

The Organization/Consortium shall carry out a geospatial clean cooking analysis that facilitates data-driven planning, coordination and decision-making to support the uptake and adoption of MECS throughout the country. More specifically, the analysis should:

- Promote a holistic approach toward clean cooking that leverages all relevant fuels/technologies (e.g. LPG, biogas, electric cooking, improved cookstoves, etc).
- Support evidence-based, comprehensive planning and investments by allowing decision makers to: (1) visualize and assess the market for different clean cooking solutions (status, opportunities and gaps); and (2) explore linkages, evaluate trade-offs and compare consequences of different clean cooking strategies/scenarios (e.g. investment requirements).
- Serve as central and common framework around which different national and sub-national stakeholders can coordinate/align their respective clean cooking plans and activities.
- Be linked with the geospatial electrification analysis to facilitate an integrated view between electrification and clean cooking solutions.

To carry out this analysis the Organization/Consortium is expected to carry out the following sub-tasks:

Task 3.1: Development of analysis criteria and parameters (scenarios and targets)

The Organization/Consortium shall define, in collaboration with the Government of Sierra Leone and other relevant stakeholders, different scenarios for access to cooking technologies and fuels. The scenarios should: (1) consider a mix of appropriate technologies/fuels; (2) be normative based on targets set by the stakeholders involved and; (3) use national and/or international standards/tiers for what constitutes “improved”, “clean” and “efficient” cooking access.

Task 3.2: Data collection and processing

The Organization/Consortium shall collect, clean and compile all available data relevant to this exercise.

Below are some of the envisioned types of datasets that will need to be collected:

- Datasets that identify populations without MECS
    - Access to cooking fuels and technologies: Proportion of population with access and sustained use of clean cooking technologies/fuels
    - Women-led households: Estimated proportion of households in which an adult female is the sole or main income producer and decision-maker
- Datasets that characterize and calculate demand
    - Institutional cooking: Location of schools, universities, health centers and other major institutions that have cooking needs

    - Consumer preference: Consumer needs and preferences for different cooking solutions, by cooking service
    - Consumer affordability of different cooking solutions
- Datasets that help determine clean cooking potential and technologies
    - Forest cover: Extent of forest cover and mapping of protected areas
    - Annual deforestation rate: Annual rate of land removal of a forest or stand of trees into farms, ranches, urban use or other non-forest uses
    - Other biomass sources (non-forest such as e.g. livestock, waste, sugar cane): Current and potential agricultural activity as an indicator of agricultural residues
    - LPG and other biofuel infrastructure: Surface transportation networks and location of refill points
- Datasets that inform scenario analyses
    - Co-benefits: health, climate and gender equity (including job creation livelihood)
    - Time spent on gathering of biomass fuels and other things such as water

Task 3.3: Development of geospatial clean cooking model

Based on the defined functions and features, the Organization/Consortium shall establish/develop a geospatial model for clean cooking for Sierra Leone that can be integrated, where necessary, with the model developed for electrification.

The model should be developed taking into consideration that SEforALL may, depending on the success and utility of this assignment, replicate this effort with other countries in the future. As such, the Organization/Consortium should develop a 'generalized' model that can be easily customized for different country circumstances, needs and priorities.

Task 3.4: Scenario analysis

The Organization/Consortium should examine the lifetime cost of ownership of different clean cooking solutions (i.e. LPG, electric stovetop, improved cookstoves, etc.), as well as the costs associated with deploying different clean cooking solutions (e.g. required infrastructure or supply chains). This would include understanding the cost of the cooking apparatus, replacement timeframes and the cost of energy input (e.g. LPG vs. electricity vs. other technologies/fuels). Understanding these elements may require surveying the cost of relevant appliances at local markets in Sierra Leone and understanding the typical energy consumption profile of the different appliances/technologies. Cost modeling should also take into account opportunity costs associated with fuel consumption (e.g. time spent collecting firewood or the environmental risk of accelerating deforestation).

The Organization/Consortium should then model the target scenarios using the geospatial data and cost-benefit analysis. For this analysis, the Organization/Consortium should consider factors such as proximity to existing resources or infrastructure (e.g. LPG depots and distribution points) and whether the settlement is a high enough consumption tier to support a specific fuel/technology (e.g. LPG/ biogas expansion, etc.). The Organization/Consortium should work closely with the Ministry of Energy of Sierra Leone to gain access to the necessary custodians of clean cooking information (e.g. location of distribution warehouses and retail points of sale for improved cookstoves, LPG, etc.).

Ultimately, the analysis' outputs should identify the costs and benefits of different scenarios for access to cooking technologies and fuels.

Task 4: Building on the updated and new geospatial data layers and analysis from the Integrated Energy model, the Organization/Consortium will develop a model to help the Government of Sierra Leone understand and quantify the tradeoffs of a nation-wide, roll-out of a potential COVID-19 vaccine, considering the constraints and opportunities around cold chain storage and transportation and their associated costs

The module should focus on analyzing the cooling requirements necessary to deliver different potential configurations of the COVID-19 vaccine across the cold chain and points-of-care, and provide visibility into the tradeoff between maximizing distribution of the vaccine to the vulnerable populations who need it, and the attendant costs of the mix of energy and non-energy cooling solutions necessary to deliver the vaccine. These different COVID-19 vaccine 'scenarios' should be determined in close collaboration with and input from those organizations responsible for, or involved in, broader COVID-19 responses (e.g. MoHS, WHO, GAVI). Throughout this analysis, the Organization/Consortium shall consider opportunities to reduce energy demand – through energy efficiency - for cooling across the cold chain.

To do this, the Organization/Consortium will:

- Determine preparedness for vaccine delivery on the basis of the quality and reliability of existing cold storage and cold chain infrastructure.
- Identify the additional cooling needs for temperature-controlled cold chains from importation to warehousing, transport, and point-of-care across vaccine delivery scenarios that adjust for required volumes, cooling requirements, and frequency of delivery.
- Determine the tradeoffs (social, economic and environmental) inherent in the mix of energy and non-energy related cooling solutions necessary to guarantee temperature control for a COVID-19 vaccine from importation to point-of-care across delivery scenarios, including different scenarios on: quantity of vaccines required, frequency of administration, and the temperature windows for vaccine. Identify the contribution of additional energy and non-energy related cooling solutions to a long-term logistics framework for the delivery of regular vaccines, medicine, and blood products; this can include the redeployment of existing (excess) cooling capacity from the agricultural sector.
- Determine the total cooling and energy needs for different delivery scenarios, including different scenarios on: quantity of COVID-19 vaccines required, frequency of administration, the temperature windows for vaccine, and the co-benefits for existing immunization programs.
- Determine the total cooling cost (CapEx and OpEx) associated with different delivery scenarios of a potential COVID-19 vaccine.
- Determine where and how the different delivery scenarios of a potential COVID-19 vaccine could be leveraged to strengthen Sierra Leone's existing medical cold chain for other vaccines, medicine and blood products while avoiding stranded assets.

To inform this analysis, the Organization/Consortium is expected to find and use a variety of datasets, including, for example:

- Sierra Leone's geospatial model for least-cost electrification, which includes: (i) population density by community; (ii) current status of electrification per community; (iii) least cost technology for bringing new connections to each community.
- The location of health facilities across Sierra Leone. Information on location of health facilities in Sierra Leone can be obtained from the Ministry of Health and Sanitation. In addition, GAVI

through its Cold Chain Equipment Optimizations Platform typically has information on the cold storage capabilities of health facilities (type and size of fridge), and their electrification status.
- Road quality.
- Vaccine spoilage data for Sierra Leone, including the causes of spoilage, where available.
- The volume and reliability of existing cold chain and cold chain equipment. Understanding the existing cold chain capacity and reliability is crucial to informing the need based on different delivery scenarios.
- Temperature data across cold chain routes to determine points of risk for temperature control of vaccines.
- Populations at risk.

Multiple government ministries/agencies (including, for example, the Sierra Leonean Ministry of Health and Sanitation) and development partners will likely have an interest in the module and execute its results in terms of strengthening cold-chain network. As such, the Organization/Consortium is expected to begin this exercise by consulting a wide range of relevant stakeholders to identify their specific needs, requirements and functionality and to ensure that the module is aligned with broader efforts and strategies for rolling out a COVID-19 vaccine.

Task 5: Ensure the Integrated Energy model (electrification and cooking) is accessible and usable for the public and private sector

In order for the model (electrification and cooking) to provide the most value, the Organization/Consortium needs to ensure that it is structured in such a way that it is both accessible and usable by several parties, particularly private sector companies looking to expand energy access. Significant work needs to focus on the user experience (UX) and the user interface (UI). There are several key design features that need to be considered:

- Users should be able to visualize all relevant and available data layers used as inputs to the analysis (e.g. grid infrastructure existing and planned, population distribution or structures dataset, location of public facilities and major demand centers, resource potential throughout the country, road network, etc.).
- At a minimum, private sector players will need to be able to run model runs using existing datasets in the model (but selecting their own assumptions and parameters), and download results out of the model.
- Several output report templates need to be defined that would be useful for private sector players. At a minimum, these output reports would include: (1) list of communities with associated parameters, such as GPS coordinators, income per capita, cheapest electrification source, etc. and (2) data formats that enable visualization of results.
- The model should use open source data in its logic. Some of these data sets might be updated by their owners/contributors with some frequency. Each of the input datasets will need to be evaluated to determine if future updates to the data will be critical to the model's accuracy, if the data is expected to be updated regularly, and if so, how best to enable the model to consume those future versions of the data. This will require rules to be crafted that guide how open source updates would happen and would be governed.
- These and other features, including for example the need for nested authorities and access levels, will be determined in conjunction with SEforALL and through a series of consultations with external parties.

In order to do this, the following activities will be undertaken:

- **Determine data disclosure limitations and considerations:** The Organization/Consortium should begin by evaluating what limitations or considerations there are to making data publicly available. This includes, for example, identifying at what level of granularity each dataset can be made public (e.g. local government areas vs settlements).
- **Interviews with stakeholders to determine user needs:** The Organization/Consortium should carry out a series of interviews with stakeholders, including SHS and mini-grid companies, banks and other financial services providers, and government agencies to determine what features will be most important for them in an online, accessible tool.
- **Evaluation of potential features to offer:** With a full list of potential uses, the cost benefit trade-off of providing specific features, vs. not providing them should be understood. The Organization/Consortium should work with SEforALL to evaluate the advantages and disadvantages of different features and determine the list of elements that will be included.
- **Engage with online service provider:** The Organization/Consortium should, as an integral part of the proposal, develop, or preferably make use of an existing, visualization tool / user interface for the Integrated Energy Plan, and build and embed the features into the tool that can then be installed on a dedicated or cloud server and made available through a publicly accessible website, determined by SEforALL and the Government of Sierra Leone. The Organization/Consortium may utilize an external service provide for this activity if necessary. The visualization tool / user interface should be developed so that it can be deployed for different country settings with only minimal additional development.

Task 6: Document, disseminate and transfer data/results

The Organization/Consortium shall prepare a draft final report, documenting in appropriate detail the methodological framework and key assumptions, results of the analysis and recommendations for each of the following: (1) the geospatial least-cost electrification plan; (2) the clean cooking analysis; and (3) the cold-chain / COVID analysis. Taking into account comments and feedback received from SEforALL and the Government of Sierra Leone, the Organization/Consortium shall revise the draft reports and finalize them for delivery. Finally, the Organization/Consortium shall produce, for SEforALL, a separate summary report that highlights lessons learned and best practices, to ensure learnings are carried forward.

In coordination with the government of Sierra Leone and with support from SEforALL, the Organization/Consortium shall organize several dissemination workshops, where the results and analysis are to be presented. A minimum of four workshops are envisioned; two for the Sierra Leonean Government (one on electrification and cooking and one on COVID-19), one for the off-grid industry and one for the clean cooking sector. The workshops shall take place in-person (with the option of virtual attendance) unless this is deemed unsafe/infeasible due to COVID-19 / travel restrictions, in which case the workshops shall be virtual.

Prior to finalizing the reports and hosting the dissemination workshops, the Organization/Consortium shall ‘stress test’ its analysis and findings through a series of consultations with relevant stakeholders. These consultations should cover the electrification, cooking and cooling/COVID-19 elements of this assignment.

The Organization/Consortium shall also transfer to the Government of Sierra Leone the complete and comprehensive set of data used/developed during this assignment. The Organization/Consortium must

ensure that these key datasets are shared along with metadata and collection methods. Where appropriate, reference will be made to licensing agreements for specific datasets. The information will be shared in an accessible format agreed upon by the Organization/Consortium, SEforALL, and the Government of Sierra Leone.

Task 7: Build the capacity of key stakeholders

The Organization/Consortium shall conduct, at a minimum, two (2) trainings during the assignment, aimed at professional staff, to familiarize them with the GIS data layers, the overall capabilities of the models (electrification/cooking and cooling/COVID) and online user interface, the methodology and analysis framework for updating the geospatial analysis in the future and key variables for sensitivity analysis. The Organization/Consortium shall ensure that participants are fully trained to independently operate and extend the model in the future for analytical and decision-making purposes. Activities should include but are not limited to workshops, webinars and a set of online training documents (e.g. how-to guides and tutorials). The Organization/Consortium shall work with SEforALL and the Government of Sierra Leone to identify which staff and organizations will receive training. The workshops shall take place in-person (with the option of virtual attendance) unless this is deemed unsafe/infeasible due to COVID-19 / travel restrictions, in which case the workshops shall be virtual. The Organization/Consortium will also support SEforALL and the Government of Sierra Leone in identifying the appropriate institutional and organizational arrangements to manage and maintain the model and its associated datasets and databases.

4. Gender Mainstreaming

The selected Organization/Consortium should make a concerted effort to mainstream gender considerations throughout the design and implementation of this assignment. This includes, for example, identifying or creating appropriate datasets and updating models with gender-disaggregated data on particular populations lacking access to electricity and clean cooking, customer preferences and demand for different appliances, or differentiated outcomes of technology employed for productive uses. The selected Organization/Consortium shall also work to ensure all trainings and stakeholder engagements are gender balanced.