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Electricity Distribution and Supply Authority

TERMS OF REFERENCE

RECRUITMENT OF A CONSULTING FIRM OR CONSORTIUM TO UNDERTAKE FEASIBILITY STUDIES, SCOPING AND PRELIMINARY DESIGN; DETAILED DESIGN AND PREPARATION OF BIDDING DOCUMENTS; ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA); RESETTLEMENT ACTION PLAN (RAP); AND GENDER GAP ANALYSIS

Sierra Leone Rural Electrification Access Project (SLREAP)
Implementing Agency: Electricity Distribution and Supply Authority (EDSA)
Financier: African Development Bank (AfDB)
Project ID: P-SL-FA0-003
Procurement Package No.: SL/EDSA/AfDB/SLREAP/SER/QCBS/C2/001/2026
Financing/Loan Reference: ADF 2100150044743

1. INTRODUCTION

1.1 These Terms of Reference (ToR) are prepared for the recruitment of a qualified consulting firm, or a consortium/joint venture of firms (the Consultant), to provide integrated technical, engineering, economic, financial, environmental, social and gender consultancy services for the preparation of the Sierra Leone Rural Electrification Access Project (SLREAP). The studies are financed by the African Development Bank (AfDB, or the Bank) and implemented through the Electricity Distribution and Supply Authority (EDSA, or the Client).

1.2 The assignment comprises: (i) feasibility studies, scoping and preliminary design, including economic and financial analysis; (ii) detailed engineering design and preparation of bidding documents; (iii) Environmental and Social Impact Assessment (ESIA), including Environmental and Social Management Plans (ESMPs); (iv) Resettlement Action Plans (RAPs); and (v) a gender gap analysis and costed Gender Action Plan. Items (i) to (v) shall be prepared separately for each line route, together with its associated substations and distribution networks, so that each line route is ready for financing and implementation.

1.3 The Consultant shall work in accordance with these ToR, applicable Sierra Leonean laws and regulations, relevant AfDB policies and requirements and the resulting contract. The line routes, substations, communities and asset quantities described in these ToR are indicative. The Consultant shall verify and confirm them through the studies and shall determine the final number of communities to be electrified.

1.4 These ToR are organised in two parts. Section A, the General Assignment Section (this Section, Sections 1 to 10), sets out the requirements common to the whole assignment: background and context, the overall scope of services, expected deliverables, schedule, qualifications and expertise, selection method, payment terms, the Client's responsibilities, quality assurance, reporting and review, and ownership and confidentiality. Section B, the Specific Assignment Section, contains the detailed requirements for the specific workstreams and comprises three Annexes: Annex I (techno-economic feasibility studies, detailed engineering design and preparation of bidding

documents for the proposed transmission lines and substations), Annex II (Environmental and Social Impact Assessment) and Annex III (Resettlement Action Plan). Stakeholder engagement and the gender gap analysis are specified in Sections 3.4 and 3.7 of Section A. Section B is an integral part of Section A: the two Sections shall be read together as the single scope of one consultancy contract, and the Annexes do not describe separate assignments.

2. BACKGROUND AND CONTEXT

2.1 Background

Currently, Sierra Leone's sources of power generation include public and private assets from three main sources: (i) the Bumbuna hydropower plant; (ii) Karpowership, a private Independent Power Producer (IPP) liquid fuel-based generation plant (heavy fuel oil, HFO); and (iii) the Côte d'Ivoire–Liberia–Sierra Leone–Guinea (CLSG) regional transmission network, with a power purchase agreement (PPA). In addition to these major generation systems, there are standalone systems in different regions of the country. The total installed capacity, including the signed contracts with the IPPs, is about 300 MW. However, due to the seasonal hydrology of Bumbuna, high levels of fluctuations, and contractual and payment issues with the IPPs, the available capacity as of 2026 is estimated at only about 100–140 MW, and falls considerably during the dry season. Most of the EDSA units are down due to poor maintenance and lack of spare parts. The short-term plan is to make the best use of the CLSG interconnection network to source more power from the regional countries and take advantage of the West African Power Pool (WAPP) market. Sierra Leone is fully integrated into the WAPP network through the CLSG interconnection.

SLREAP is intended to support improved electricity access in rural and underserved areas of Sierra Leone. Effective preparation requires evidence-based feasibility analysis, appropriate engineering solutions, reliable cost estimates, procurement-ready documents and timely identification and management of environmental and social risks. The Consultant shall coordinate all workstreams so that design assumptions, land requirements, cost estimates, mitigation measures and implementation schedules are consistent.

2.2 Project rationale and development objective

The proposed project is consistent with the Medium-Term National Development Plan (MTNDP, 2024–2030) and directly supports three key energy sector objectives of the Government outlined in it: (a) electrification of all district headquarters, which is a key element of the country's electrification strategy; (b) increasing rural electrification through the engagement and involvement of key stakeholders, including the private sector; and (c) improving the financial performance of the sector for sustainable development. During dialogue with the Bank, the Ministry of Energy and the Ministry of Finance of the Republic of Sierra Leone emphasized the country's urgent need and agenda to achieve universal access. The Government identified these studies as a priority and requested the Bank's support to carry them out. The studies will enhance the quality of the project at entry and support resource mobilization by the Bank and other development partners for its implementation.

The overall Development Objective of the project is to increase electricity access in Sierra Leone. Specifically, the project will contribute to raising the national electricity access rate, currently estimated at 35%, to more than 50%. The increased electricity access will generally contribute to improving the welfare of the beneficiaries and will lead to the development of social and income-generating activities. More particularly, SLREAP will extend the transmission network and electrify communities located along the grid, indicatively estimated at about 60 communities, and supply electric power to schools, health centers, small handicrafts, and commercial and industrial businesses, including enterprises operated by women. These achievements will help improve the performance of schools and health services, as well as increase the incomes of the people.

2.3 Indicative project scope and line routes

The studies shall assess in detail the feasibility and implementation arrangements of SLREAP, which is indicatively proposed to comprise: fourteen (14) primary substations, being ten (10) 66 kV primary substations (66/33/11 kV) and four (4) 33 kV primary substations (33/11 kV), as listed in Table 3; more than two hundred and ten (210) 33/0.4 kV distribution substations, approximately 513 km of 66 kV transmission lines, approximately 252 km of 33 kV distribution networks, about 88,000 customer connections including prepayment meters, and street lighting in the communities to be electrified. All quantities are indicative and shall be confirmed by the Consultant.

The indicative line segments are set out in Table 1 and are grouped into line routes in Table 2. The proposed primary substations along these lines are listed in Table 3 (Section 2.5). All lengths are preliminary and shall be verified through route surveys.

Table 1: Indicative line segments

Voltage level	Line segment	Indicative length (km)
66 kV	Bandajuma – Taiama	65.36
66 kV	Taiama – Moyamba Junction	28.85
66 kV	Moyamba Junction – Mile 91	20.56
66 kV	Mile 91 – Magburaka	58.00
66 kV	Magburaka – Bumbuna	52.8
66 kV	Bandajuma – Mbaomahun	74.00
66 kV	Bandajuma – Sumbuya	65.36
66 kV	Lungi – Port Loko – Rogbere – Lunsar	108
66 kV	Port Loko – Kambia	40
66 kV	**Subtotal**	**≈ 513**
33 kV	Moyamba Junction – Mile 91	20.56
33 kV	Taiama – Mano Dasse	21.38
33 kV	Taiama – Njala Mokonde Town – Njala University campus	12.00
33 kV	Mbaomahun – Mongere – Yele	28.64
33 kV	Sumbuya – Naiagolehun	24.60
33 kV	Sumbuya – Sahn Malen	38.20
33 kV	Sumbuya – Mamboima	21.10
33 kV	Kabala – Dogolia – Musaia	21.5
33 kV	Kambia – Barmoi – Rokupr	13.25
33 kV	Kambia – Mange – Mambolo	29.3
33 kV	Lungi – Pepel	21
33 kV	**Subtotal**	**≈ 252**

Table 2: Indicative Line Routes and Justifications

Route #	Route Description	Line Rating (kV)	Priority	Justification

1	Bandajuma – Sumbuya – Mbaomahun	66	1	Predominantly agricultural area with major commercial farming operations (e.g., Sierra Tropical and Sucfin). Gold mining area.
2	Bandajuma – Mile 91 – Magburaka – Bumbuna	66	3	Predominantly agricultural area with large customers and other high-value commercial activities (e.g., MIRO Forestry, Njala University and Magbass Sugarcane).
3	Lungi – Port Loko – (Kambia and Lunsar via Port Loko)	66	4	Large-scale mining at Lunsar–Marampa; agriculture, including poultry at Lokomasama and rice research and farming at Rokupr and Mambolo; and CTC bauxite mining at Kambia.
4	Kabala – Dogolia – Musaia	33	5	Large-scale agriculture at Musaia and Dogolia, and a large-scale water processing system at Musaia.
5	Taiama – Njala Mokonde – Njala University	33	6	Predominantly agricultural area with the Njala University, an educational institution with agricultural research ongoing.

Existing networks along the corridors include an 11/0.4 kV mini-grid at Taiama, 0.4 kV mini-grids at Mano Dasse and Moyamba Junction, and 0.4 kV networks at Naiagolehun, Sumbuya, Sahn Malen and Koribondo. The distribution network at Moyamba Town is nearing completion under Government funding. Land for a substation is available at Mile 91, has been allocated at Sumbuya and Sahn Malen, and has not yet been identified at Mbaomahun. Potential anchor loads include Sierra Tropical at Sumbuya, with about 1.5 MW of current self-generation and a projected requirement of 3.3 MW, and Sucfin Agricultural Company at Sahn Malen. The Consultant shall confirm the condition of these networks, their integration with the proposed infrastructure and the demand and willingness to connect of the anchor customers.

During inception, the Consultant shall confirm the grouping of segments into line routes and the allocation of each substation, community and anchor customer, including Koribondo and other communities along the corridors, to a line route. Any regrouping shall be agreed in writing with the Client. Primary substation locations are subject to confirmation of land availability and the load and network studies.

The analysis shall also assess, at feasibility level and as separate line routes, the following: a 66 kV line connecting Lungi – Port Loko – Rogbere – Lunsar and Port Loko – Kambia, with Magburaka supplied at 33 kV, together with the Port Loko – Barmoi – Kambia extension. Alternatives outside the confirmed scope may be recommended for consideration but shall not be treated as authorized additional services.

2.4 Line-route approach

Given the scale of the programme and the limited resources available, SLREAP will be prepared on a line-route basis. Each line route, together with its associated substations, distribution networks, connections and street lighting, shall be studied as a self-contained investment package with its own feasibility study, economic and financial analysis, ESIA and ESMP, RAP, detailed design and bidding documents.

Based on the studies, the client will select the line route(s) with the highest development impact for priority financing by the AfDB and potential co-financiers. The remaining line routes will be presented to other development

partners for financing. Each route-level deliverable shall therefore be complete and capable of being appraised and implemented independently of the other line routes, while recording any technical dependencies between routes.

The Consultant shall prepare a Route Prioritisation Report that ranks the line routes using transparent criteria agreed at inception. These shall include the number of connections, cost per connection, economic and financial returns, anchor and productive-use loads, social facilities served, environmental and social risks, resettlement requirements, implementation readiness and network dependencies.

2.5 Substations

The proposed line routes can supply communities, anchor customers and social facilities only if they are supported by substations that evacuate power at the line terminals, step the transmission voltage down to distribution levels and provide the switching and protection needed for a reliable network. SLREAP therefore proposes fourteen (14) primary substations along the proposed lines, comprising ten (10) 66 kV primary substations (66/33/11 kV) and four (4) 33 kV primary substations (33/11 kV), as listed in Table 3. The Remarks column of Table 3 indicates the line from which each substation is proposed to evacuate or distribute power, with reference to the line segments in Table 1.

The Consultant shall study each substation as part of the line route it serves. For each substation, the Consultant shall confirm the need, location, voltage level, configuration and capacity through load forecasts, load-flow, short-circuit and protection studies and through site and geotechnical investigations; confirm land availability and ownership; and prepare the layouts, single-line diagrams, detailed designs, bills of quantities and bidding documents. Substation sites shall also be covered by the ESIA/ESMP and RAP of the line route concerned. The number, locations and ratings in Table 3 are indicative and shall be confirmed or adjusted through the studies, with any change agreed in writing with the Client.

Table 3: Proposed List of Substations

No.	Substation location	Voltage Level (kV)	District	Remarks
	66kV Substations			
1	Sumbuya	66	Bo District	Proposed to distribute power from the Bandajuma – Sumbuya line
2	Lunsar	66	Port Loko District	Proposed to distribute power from the Lungi – Port Loko – Rogbere – Lunsar line
3	Mile 91	66	Tonkolili District	Proposed to distribute power from the Moyamba Junction – Mile 91 and Mile 91 – Magburaka lines
4	Taiama	66	Moyamba District	Proposed to distribute power from the Bandajuma – Taiama and Taiama – Moyamba Junction lines
5	Lungi	66	Port Loko District	Proposed to distribute power from the Lungi – Port Loko line

6	Magburaka	66	Tonkolili District	Proposed to distribute power from the Mile 91 – Magburaka and Magburaka – Bumbuna lines
7	Kambia	66	Kambia District	Proposed to distribute power from the Port Loko – Kambia line
8	Port Loko	66	Port Loko District	Proposed to distribute power from the Lungi – Port Loko and Port Loko – Kambia lines
9	Mbaomahun	66	Bo District	Proposed to distribute power from the Bandajuma – Mbaomahun line
10	Bumbuna	66	Koinadugu District	Proposed to evacuate power from the Bumbuna hydropower plant through the Magburaka – Bumbuna line
	33kV Substations			
1	Sahn Malen	33	Pujehun District	Proposed to distribute power from the Sumbuya – Sahn Malen 33 kV line
2	Dogolia	33	Kabala District	Proposed to distribute power from the Kabala – Dogolia – Musaia 33 kV line
3	Mambolo	33	Kambia District	Proposed to distribute power from the Kambia – Mange – Mambolo 33 kV line
4	Pepel	33	Port Loko District	Proposed to distribute power from the Lungi – Pepel 33 kV line

3. THE ASSIGNMENT

3.1 Overall approach

The Consultant shall provide an integrated service from inception through feasibility assessment, design, environmental and social assessment, procurement documentation and finalisation. Whether a single firm or a consortium/joint venture, supported where necessary by specialist sub-consultants, the Consultant shall be responsible for the full scope and all deliverables under one contract. It shall appoint one Team Leader and named leads for engineering, economic and financial analysis, environmental assessment, resettlement and gender. During inception, the Consultant shall validate the project scope and line routes with EDSA and the Project Implementation Unit (PIU), identify information gaps and obtain approval of a detailed work plan. Assumptions and limitations shall be clearly documented.

The Consultant shall use a common set of maps, project descriptions and survey references for all workstreams. Household surveys and consultations shall be coordinated to avoid repeated visits and inconsistent information. A household sample used for demand or gender analysis shall not substitute for the census of all project-affected persons required for the RAP. Route and site selection shall be reviewed jointly by the engineering and safeguards

specialists. Any change affecting land requirements, people, habitats or mitigation costs shall be reflected in the designs, ESIA, RAP, quantities and estimates before final submission.

3.2 Scope of services

3.2.1 Against the background set out in Section 2, EDSA seeks to engage the Consultant to undertake, for each line route, the services listed in paragraph 1.2, so as to bring the proposed rural electrification interventions in Sierra Leone to implementation readiness.

3.2.2 The Consultant shall have overall responsibility for undertaking the technical, economic, financial, engineering, environmental, social and gender assessments required to establish the feasibility and implementation readiness of the proposed rural electrification interventions. The Consultant shall assess electricity demand and existing infrastructure, identify and evaluate feasible electrification options, recommend appropriate and sustainable solutions, undertake the necessary field surveys and investigations, prepare preliminary and detailed engineering designs, and develop technical specifications, bills of quantities, cost estimates and bidding documents. The Consultant shall also identify and assess potential environmental and social risks and impacts, prepare the required ESIA and associated management instruments, prepare RAPs to address land acquisition, displacement, restrictions on land use and livelihood impacts, and undertake the gender gap analysis and prepare the Gender Action Plan. All outputs shall be prepared in accordance with applicable laws and regulations of Sierra Leone, these ToR and relevant AfDB requirements.

3.2.3 The Consultant shall liaise with EDSA, the Electricity Generation and Transmission Company (EGTC), the Ministry of Energy (MoE), the PIU, the Project Coordinator and other designated technical specialists and stakeholders on all matters relating to the consultancy. The Consultant shall provide the technical and administrative support necessary for effective delivery of the assignment, coordinate the engineering and environmental and social workstreams, undertake stakeholder consultations, and ensure consistency across feasibility assessments, designs, cost estimates, ESIA/RAP instruments and bidding documents. The Consultant shall also be responsible for submitting inception, periodic progress, draft and final reports; maintaining appropriate quality assurance and document control procedures; responding to consolidated comments from the Client and, where applicable, AfDB; and providing all supporting data, drawings, calculations and other deliverables required under the contract. The reporting arrangements and work schedule shall be agreed with the PIU and aligned with the approved project implementation schedule and applicable AfDB review requirements.

3.2.4 The Consultant's task areas are listed below, with details in the respective annexes of Section B, which form an integral part of these ToR (see paragraph 1.4). The expected deliverables are set out in Section 3.3. The task areas are:

a. Conducting feasibility studies, scoping assessments and preliminary designs for each line route, including demand assessments, site investigations, economic and financial analysis and evaluation of technically, economically and financially viable electrification options, and ranking the line routes (Annex I);
b. Undertaking detailed engineering designs and preparing technical specifications, bills of quantities, cost estimates, drawings and bidding documents for the proposed rural electrification infrastructure, including the fourteen (14) primary substations listed in Table 3, packaged separately for each line route (Annex I);
c. Conducting Environmental and Social Impact Assessment (ESIA) studies for each line route, identifying potential environmental and social risks and impacts, and preparing the required environmental and social management instruments in accordance with applicable Sierra Leonean legislation and relevant AfDB requirements (Annex II and Section 3.5);

d. Preparing a Resettlement Action Plan (RAP) for each line route, including assessment of land acquisition, physical or economic displacement, restrictions on land use and impacts on livelihoods, and preparation of appropriate resettlement and compensation measures (Annex III and Section 3.6);
e. Coordinating with EDSA, the PIU, the Project Coordinator, relevant technical specialists, government institutions, local authorities and affected communities to facilitate effective delivery of the assignment;
f. Undertaking stakeholder consultations and field missions, collecting and analysing relevant technical, environmental, social and socioeconomic data, and ensuring that stakeholder concerns are appropriately considered in the feasibility studies, designs and safeguard instruments (Section 3.4);
g. Providing technical advice and recommendations to EDSA, MoE and the PIU on the feasibility, design, implementation arrangements, cost implications, risks and sustainability of the proposed rural electrification interventions;
h. Preparing inception, periodic progress, draft and final reports covering the assignment, together with the required supporting data, calculations, drawings, maps and other technical documentation;
i. Undertaking a gender gap analysis covering the Ministry of Energy, relevant energy subsectors and the project communities, and preparing a costed Gender Action Plan (Section 3.7); and
j. Performing such other related tasks as may be assigned by EDSA, MoE, the Project Coordinator or the PIU from time to time, provided that such tasks fall within the agreed scope of the consultancy and the terms of the contract. Any additional services shall be subject to a contract amendment.

3.3 Expected deliverables

The outputs corresponding to the task areas in Section 3.2.4 are listed below and are elaborated in the annexes of Section B. Their timing and the submission of route-level outputs are set out in Section 3.10.

a. An **Inception Report** prepared following consultations with EDSA, MoE, the PIU and relevant stakeholders, setting out the Consultant's understanding of the assignment, proposed methodology, work plan, implementation schedule, staffing arrangements, fieldwork requirements, responsibilities of the parties, quality assurance procedures, reporting arrangements and anticipated deliverables;
b. **Route Feasibility Study Reports and a Route Prioritisation Report** presenting, for each line route, baseline information, electricity demand assessments, field survey findings, assessment of existing infrastructure, analysis of feasible rural electrification options, technical comparisons, economic and financial analysis, preliminary designs, cost estimates, implementation arrangements, risks and recommendations on the preferred options, together with a comparative ranking of the line routes (Annex I);
c. **Detailed Engineering Designs and Bidding Documents** for each line route and its associated primary substations (Table 3), including detailed design reports, engineering drawings, technical specifications, bills of quantities, engineer's cost estimates, implementation schedules and complete bidding documents suitable for procurement of the proposed works and related services (Annex I);
d. **Environmental and Social Impact Assessment Reports and Environmental and Social Management Plans** for each line route, identifying and assessing the potential environmental and social risks and impacts of the proposed interventions and setting out appropriate mitigation measures, environmental and social management arrangements, monitoring requirements, stakeholder engagement measures and grievance redress arrangements (Annex II and Section 3.5);
e. **Resettlement Action Plan Reports** for each line route, documenting the findings of the census, socioeconomic and asset surveys, affected persons and assets, eligibility criteria, compensation and livelihood restoration measures, consultation outcomes, implementation arrangements, monitoring requirements and estimated resettlement costs (Annex III and Section 3.6);

f. **Gender Gap Analysis Report and costed Gender Action Plan** covering the Ministry of Energy, relevant energy subsectors and the project communities along each line route (Section 3.7);
g. **Stakeholder Engagement Plan and Stakeholder Consultation and Field Assessment Reports** documenting consultations with relevant institutions, local authorities, communities and other stakeholders, together with key findings, issues raised, responses and recommendations for consideration in the project designs and environmental and social instruments (Section 3.4);
h. **Technical Advisory and Recommendations Reports** providing EDSA/EGTC and the PIU with reasoned recommendations on the preferred electrification options, design solutions, maps (existing and proposed transmission and distribution line routes) and single line diagrams, estimated project costs, implementation readiness, technical risks and measures required to support effective and sustainable project implementation;
i. **Monthly Progress Reports** outlining activities undertaken, progress against the work plan by workstream and line route, fieldwork completed, emerging findings, consultations held, issues encountered, risks, proposed corrective actions and activities planned for the subsequent reporting period; and
j. **A Final Consultancy Report and Complete Deliverables Package**, consolidating, for each line route, the final feasibility study, detailed designs, bidding documents, ESIA/ESMP (inclusive of the relevant plans) and RAP, together with the final Route Prioritisation Report, Gender Gap Analysis and Gender Action Plan, stakeholder consultation and disclosure records, cost estimates, supporting technical data, maps, calculations, editable models and all other agreed outputs. The Consultant shall incorporate consolidated comments from EDSA/EGTC, MoE and the PIU and address comments arising from AfDB review in accordance with the contract and agreed review procedures.

3.4 Stakeholder engagement

The Consultant shall prepare the Stakeholder Engagement Plan (SEP) for the project, with route-specific annexes. The SEP shall identify affected communities and other interested parties, the information to be disclosed, suitable consultation methods, arrangements for reaching women and vulnerable people, and responsibilities for continued engagement during implementation. Consultations shall be held during screening and option selection and again on the draft findings. Information shall be disclosed early enough for people to consider it and influence the studies, using relevant local languages and accessible formats. A consultation record shall show the issues raised, the responses given and the changes made.

3.5 Environmental and social impact assessment

The Consultant shall prepare an ESIA and ESMP for each line route, covering lines, substations, ancillary works and associated facilities. The PIU, AfDB and the Environment Protection Agency of Sierra Leone (EPA-SL) shall agree on the assessment boundaries and report packaging. The assessment shall comply with national requirements and the AfDB Integrated Safeguards System, as revised, including the Bank's applicable Operational Safeguards. The Consultant shall complete screening and scoping, support the required EPA-SL submissions and prepare a scoping report identifying significant issues, the area of influence, survey methods, alternatives to be assessed and any additional management instruments needed.

Baseline information shall be sufficient to assess the effects of construction, operation and maintenance. Desk information shall be checked through field investigations, and survey locations, dates, methods, limitations and seasonal conditions shall be recorded. The baseline shall cover:

- Topography, geology, soils, slope stability, erosion, drainage, watersheds, river crossings, flood risks, water quality, and existing air quality and noise conditions.

- Terrestrial and aquatic habitats, forests, protected areas, flora and fauna, threatened and endemic species, migration routes and biodiversity hotspots, including identification of critical or otherwise sensitive habitats and the implications for route and site selection.
- Population, settlement patterns, community institutions, livelihoods, agricultural and other natural resource uses, employment, public infrastructure and access to services.
- Land use and tenure, including customary, communal and informal interests, women's land rights and access to land and resources by disadvantaged groups.
- Community health, safety and security; existing tensions; labour conditions; risks of gender-based violence (GBV), sexual exploitation and abuse and sexual harassment (SEA/SH); and the circumstances of vulnerable or marginalized people.
- Cultural heritage, including sacred sites, burial grounds, archaeological resources and cultural practices that could be affected by the works.

The Consultant shall assess direct, indirect, induced and cumulative impacts over the construction and operational periods and compare the preferred route and substation sites with feasible alternatives and the without-project case. The assessment shall address vegetation clearance and habitat fragmentation, risks to birds and other wildlife, pollution and waste, worker camps, traffic, electrical safety and electromagnetic fields where relevant, community and worker health and safety, labour influx, child and forced labour, supply-chain risks, GBV and SEA/SH, land acquisition, security arrangements and effects on livelihoods and access to resources. The Consultant shall also assess climate hazards over the design life of the infrastructure, including flooding, erosion, heat and severe weather, and incorporate the agreed adaptation measures into design specifications, costs and maintenance requirements.

Each ESMP shall state each mitigation measure, the responsible institution, timing, monitoring indicator, location, frequency, reporting requirement and cost, and shall distinguish the obligations of the Client, contractors and operating utilities. The Consultant shall prepare the following plans or procedures to the level supported by the design, identify the contractor plans required before mobilization and provide the corresponding bidding requirements:

- Occupational and community health and safety, emergency response and traffic management.
- Labour management, worker codes of conduct, worker accommodation and camp management.
- Waste and hazardous materials management, pollution prevention and rehabilitation of disturbed areas.
- Biodiversity management and tree replacement or compensatory planting.
- Cultural heritage protection and chance-find procedures.
- GBV and SEA/SH prevention and response, including confidential reporting and referral arrangements.
- Security management and project and worker grievance procedures.

The Consultant shall prepare the ESIA reports for consultation. It shall assist the PIU to arrange disclosure workshops, submit the required documentation to EPA-SL and AfDB, respond to reviewed comments and complete the steps required for environmental licensing. Licensing decisions remain with EPA-SL while Bank review and project approval are separate processes.

3.6 Resettlement action planning

The Consultant shall prepare a RAP for each line route covering physical and economic displacement resulting from permanent or temporary land acquisition, restrictions on land use and loss of access to resources. It shall work closely with the design team to avoid or reduce displacement. Each RAP shall include:

- A census of project-affected persons (PAPs) and a socioeconomic survey; a Land Acquisition Plan; georeferenced impact maps; and an inventory of affected assets, structures, crops, trees, businesses,

public facilities and communal assets, recording full and partial losses without exposing personal information in public reports.

- Identification of formal, customary, communal and other legitimate land interests; establishment and communication of the cut-off date with the PIU and relevant authorities; and arrangements for updating the census and valuations if implementation is delayed.
- A review of the national legal and institutional framework for land acquisition, valuation and compensation, compared with the applicable AfDB requirements, with measures to address any gaps.
- An entitlement matrix, replacement-cost valuation methods supported by market evidence, itemized compensation estimates and a procedure for verifying affected persons and payments, with the Consultant assisting in the verification of PAPs.
- A costed Livelihood Restoration Plan with baseline indicators, and, where relocation is required, an assessment of alternative sites with affected persons and host communities, together with assistance measures for women, older people, persons with disabilities, landless households and other vulnerable people.
- Consultation with affected persons on losses, entitlements, valuation, relocation and livelihood options, and an accessible grievance mechanism with escalation and access to judicial remedies. SEA/SH complaints shall follow a confidential referral process and shall not be handled through ordinary public mediation.
- Institutional responsibilities, a dated implementation schedule linked to the works programme, an itemized budget with inflation and contingencies, the compensation and assistance to be completed before possession of land and start of works, and internal, participatory and independent monitoring arrangements, including a completion assessment.

Compensation and livelihood restoration costs shall be shown separately from works costs to prevent double counting. Preparation of the RAPs is included in this consultancy; payment of compensation and implementation of the RAPs remain the Client's responsibility.

3.7 Gender gap analysis and Gender Action Plan

The gender analysis shall cover three levels: the Ministry of Energy, relevant energy subsectors and the SLREAP project communities, and shall therefore extend beyond the immediate project corridors. It shall explain the causes of identified gaps and distinguish institutional reforms from actions that can be financed and delivered through the project. The Consultant shall:

- Examine the representation of women and men across staffing grades, technical and managerial posts and decision-making bodies; review recruitment, retention, promotion, professional development, workplace conditions and gender mainstreaming arrangements; and review relevant policies, programmes and the availability of sex-disaggregated data.
- In the project communities, examine household and community decision-making, access to electricity, connection affordability, access to finance, energy-related workloads and participation in consultation, with particular attention to female-headed and low-income vulnerable households, women-owned enterprises and people facing additional barriers.
- Assess opportunities for women's productive use of electricity, employment, training and enterprise development, and identify the electricity needs of social facilities, particularly health facilities providing maternity care, feeding these findings into demand forecasts and connection priorities for each line route.

- Prepare a Gender Gap Analysis Report and a costed Gender Action Plan stating, for each action, the gap addressed, baseline, target, responsible institution, implementation period, budget and means of verification, and separating measures within the project budget from wider sector recommendations.
- Validate the findings with MoE and relevant stakeholders through a workshop and incorporate the agreed actions into the feasibility reports, results framework, bidding requirements and implementation arrangements.

3.8 Fragility, capacity development and knowledge transfer

The Consultant shall assess risks arising from disputes over land or benefits, exclusion, weak institutional capacity and security or access constraints, and recommend measures that can be implemented through project design, consultation, procurement and supervision. It shall prepare a costed capacity development programme for the PIU and relevant utilities covering safeguards, resettlement, gender monitoring and operation of the proposed assets, and conduct practical handover sessions on the models, designs, databases and management plans produced under the assignment.

3.9 Reporting and coordination

The Consultant shall report fortnightly to the SLREAP Project Coordinator in the EDSA PIU and coordinate with MoE, EGTC and other designated institutions. In addition to the content listed in Section 3.3(i), monthly progress reports shall state the status of each deliverable and the decisions required from the Client. Material delays, data gaps or risks shall be notified promptly. All deliverables shall be submitted to the Client, which will transmit them to AfDB for review and no-objection where required.

3.10 Duration and schedule of deliverables

The services shall commence on the date of contract signature, following completion of the procurement process, which shall be the effective date. The assignment shall be completed **within six (6) months** from the effective date of the contract. Engineering, environmental, social and gender activities shall proceed in parallel. The work plan shall show workstreams and line routes, dependencies, field investigations, consultations, design reviews, ESIA/RAP activities, Client review periods and finalization. Any change shall be managed under the contract.

The deliverables and their timing are set out in Table 4. Table 4 is the sole schedule of deliverables for the assignment and applies to all workstreams described in the Annexes, which do not contain separate schedules. Route-level deliverables shall be submitted as separate volumes for each line route. The Client will provide consolidated comments within fourteen (14) calendar days of receipt of each draft deliverable, and the Consultant shall submit the revised deliverable within ten (10) calendar days of receipt of the comments. Review of the final deliverables and the Bank's no-objection, where required, may extend the contract beyond Month 6 without extending the duration of the services and at no cost.

Table 4: Schedule of deliverables

No.	Deliverable	Main contents	Submission (from effective date)
D1	Inception Report	Understanding of the assignment, methodology and detailed work plan by workstream and line route; confirmed grouping of line segments into line routes (Tables 1 and 2) and allocation of the 14 primary	Week 1–3 Client comments within 14 days; revision within

		substations (Table 3), communities and anchor customers to each route; data gaps and information requests; staffing and deployment plan; coordinated survey and consultation programme. Route prioritisation criteria; approach and methodology for the ESIA, RAP and GBV/SEA-SH assessments; quality-assurance and document-control plan; annotated report outlines.	10 days of comments
D2	Interim Report (Data Collection, Baseline and Scoping Report; Options and Route Prioritisation Report)	**Baseline and scoping:** baseline data and assessment by line route; field verification findings; ESIA screening and scoping report and EPA-SL submission status; initial consultation record and draft Stakeholder Engagement Plan (SEP). **Options and prioritisation:** options analysis, demand forecast, preliminary design and cost estimate for each line route; comparative ranking of line routes (Route Prioritisation Report). **Substations:** need, location, voltage level and indicative capacity of each of the 14 primary substations (Table 3), based on load forecasts and preliminary load-flow and short-circuit studies; status of land availability and ownership at substation sites; topographic and geotechnical survey progress. **Safeguards and gender:** Land Acquisition Plan and census progress for each line route; gender gap analysis data collection status; presentation of key findings to the Client and stakeholders.	Week 5–9 Client comments within 14 days; revision within 10 days of comments
D3	Draft Reports (Feasibility, Detailed Design and Bidding Documents; ESIA/ESMP; RAP; Gender Gap Analysis)	**Feasibility (for each line route):** draft feasibility study with editable economic and financial models. **Design and bidding (for each line route and its associated primary substations in Table 3):** detailed designs, substation layouts and single-line diagrams, protection and SCADA schemes, drawings, technical specifications, bills of quantities, engineer's cost estimates and draft bidding documents; maps and single-line diagrams of existing and proposed networks. **Safeguards (for each line route):** draft ESIA and ESMP, covering lines and substation sites; draft RAP and Livelihood Restoration Plan; draft final ESIA/ESMP and RAP updated to reflect the designs. **Gender and capacity:** draft gender gap analysis and costed Gender Action Plan; draft stakeholder consultation	Week 11–19 Client comments within 14 days; revision within 10 days of comments. AfDB review and no-objection for draft bidding documents

		and field assessment reports; draft capacity development programme; comment-response schedules.	
D4	Final Reports	**Summary:** Executive Summary Report and PowerPoint presentation; Final Route Prioritisation Report. **For each line route:** final detailed feasibility study; technical, economic and financial analysis; detailed designs (including the associated primary substations in Table 3) and bidding documents; ESIA/ESMP (inclusive of the relevant plans); RAP; final Gender Gap Analysis Report and costed Gender Action Plan following validation; final SEP. **Supporting outputs:** consultation and disclosure records; supporting data, maps and calculations; editable files, models and GIS datasets; final capacity development programme, handover sessions and training records.	Week 21–24 AfDB no-objection to the final bidding documents, where required, may extend beyond Month 6 (Section 3.10)
PR	Progress Reports	Monthly progress reports (Section 3.3(i)) stating activities undertaken, progress against the work plan by workstream and line route, status of each deliverable, fieldwork and consultations completed, risks and corrective actions, and decisions required from the Client; fortnightly reporting to the SLREAP Project Coordinator (Section 3.9). Not a payment milestone.	Monthly, throughout the assignment

4. EXPECTED QUALIFICATIONS, EXPERIENCE AND SKILLS

4.1 Qualifications of the consulting firm or consortium

The consulting firm or consortium should possess the following qualifications:

- Demonstrated experience in power-sector planning, rural electrification, electricity distribution, energy access or comparable infrastructure assignments.
- Experience delivering feasibility studies and engineering design for electricity access or comparable power infrastructure.
- Experience preparing detailed designs, technical specifications, bills of quantities, cost estimates and bidding documents.
- Demonstrated capacity to prepare environmental and social assessment instruments and resettlement planning under national and development-financier requirements in both urban and rural settings.
- Experience managing multidisciplinary teams and coordinating engineering, economic, environmental and social workstreams.
- Experience on projects financed by the AfDB or other multilateral development banks or development partners, particularly in Africa, is desirable.
- Capacity to conduct fieldwork in Sierra Leone, consult stakeholders and deliver clear professional English reports.
- Documented project management, quality assurance and document control systems.
- Experience in preparing gender assessments and gender action plans for energy or infrastructure projects.

4.2 Key experts and non-key experts

4.2.1 The Consultant shall provide a multidisciplinary team covering the expertise below. Firms are free to propose international or national experts, provided they meet the minimum qualification and experience requirements, and no nationality requirement applies to any position. Proposals that make greater use of qualified Sierra Leonean experts and firms will be rewarded in the technical evaluation.

4.2.2 The assignment requires twelve (12) key experts, who will be evaluated individually. The key-expert positions and minimum qualifications are set out in Table 5. Detailed requirements will be specified in the Request for Proposals (RFP) issued to short-listed firms.

Table 5: Project Team (Key Experts and Non-Key Experts)

No.	Position	Minimum qualification	Minimum specific experience	Number
K1	Team Leader/Project Manager (Firm/Consortium)	Master's degree in engineering, project management or related field; PMP or equivalent certification an advantage	15 years, including overall management of at least three consultancy assignments for power sector feasibility or design studies financed by multilateral development banks; responsible for contract management, quality assurance, staffing and client relations on behalf of the firm or consortium	1
K2	Power Systems Planning and Rural Electrification Specialist	Master's degree in electrical or power systems engineering	15 years, including leading at least three feasibility and design studies for transmission, distribution or rural electrification projects, at least one financed by a multilateral development bank; proven expertise in power system planning, including load-flow, short-circuit and stability studies using industry-standard software	1
K3	Transmission Line Engineer	Bachelor's degree in electrical engineering (Master's preferred)	10 years in detailed design of overhead lines at 66 kV or above, including route surveys, tower spotting and technical specifications	1
K4	Substation Engineer	Bachelor's degree in electrical engineering (Master's preferred)	10 years in design of 66/33/11 kV substations, including layouts, power transformers, switchgear, busbar and earthing systems	1
K5	Protection, Control, automation and SCADA/Communications Engineer	Bachelor's degree in electrical, electronic or communications engineering	10 years in protection coordination, relay settings, substation automation, SCADA and telecommunication systems for HV/MV networks	1

K6	Distribution Network Engineer	Bachelor's degree in electrical engineering	10 years in design of 33/11/0.4 kV networks, service connections, metering and street lighting	1
K7	Civil/Structural Engineer	Bachelor's degree in civil or structural engineering (Master's preferred)	10 years in design of tower and pole foundations, substation civil works and buildings, drainage and access roads for power projects	1
K8	Energy Economist / Financial Analyst	Master's degree in economics, finance or related field	10 years in economic and financial analysis of power projects, demand forecasting and financial modelling	1
K9	Environmental Specialist / ESIA Lead	Master's degree in environmental science, engineering or related field	10 years in ESIAs for linear infrastructure under multilateral development bank safeguards, including at least two power line ESIAs	1
K10	Resettlement Specialist / RAP Lead	Master's degree in social sciences, land management or related field	10 years in RAPs for linear infrastructure under multilateral development bank requirements, including census, valuation and livelihood restoration, involuntary resettlement and land acquisition, both rural and urban settings	1
K11	Gender and Social Inclusion Specialist	Master's degree in gender studies, social sciences or related field	8 years in gender analyses and action plans for energy or infrastructure projects, including GBV and SEA/SH risk assessment, both rural and urban settings	1
K12	Procurement and Contracts Specialist	Bachelor's degree in engineering, law, procurement or related field	10 years in preparing bidding documents for plant and works contracts under multilateral development bank procurement rules; CIPS L4 is an added advantage	1
			Total key experts	**12**

Non-Key Experts

No.	Position	Minimum qualification	Minimum specific experience	Number
N1	Assistant Transmission and Substation Engineers	Bachelor's degree in electrical engineering	5 years in HV line and substation field surveys, data collection and design support	2
N2	Assistant Distribution Engineers	Bachelor's degree in electrical engineering	5 years in MV/LV network surveys, design and customer connection planning	2
N3	Topographic Surveyors / GIS Specialists	Bachelor's degree or diploma in land	5 years in route and topographic surveys, GPS/drone mapping and GIS database development	2

		surveying, geomatics or GIS		
N4	Geotechnical Engineer	Bachelor's degree in civil or geotechnical engineering	7 years in soil investigations and foundation recommendations for towers, poles and substations	2
N5	Quantity Surveyor / Cost Estimator	Bachelor's degree in quantity surveying, civil or electrical engineering	7 years in bills of quantities, engineer's cost estimates and construction cost analysis for power or infrastructure projects	2
N6	Hydrologist / Climate Resilience Specialist	Bachelor's degree in hydrology, environmental science or civil engineering (Master's preferred)	7 years in hydrological, flood-risk and climate vulnerability assessments for infrastructure projects	2
N7	Ecologist / Biodiversity Specialist	Bachelor's degree in ecology, biology, forestry or environmental science	7 years in baseline biodiversity surveys and critical habitat assessments for linear infrastructure	2
N8	Land Valuer / Socio-economic Survey Specialist	Bachelor's degree in land economy, estate management, social sciences or statistics	7 years in asset valuation, census and socio-economic surveys for resettlement planning	2
N9	Stakeholder Engagement and Communication Specialist	Bachelor's degree in social sciences, communication or related field	7 years in public consultation, community engagement and grievance redress mechanisms for infrastructure projects	2
N10	Health, Safety and Environment (HSE) Specialist	Bachelor's degree in occupational health and safety, environmental science or engineering; recognised HSE certification (e.g., NEBOSH or equivalent)	7 years in occupational health and safety and construction risk management for power or infrastructure projects	2
N11	Field Survey Supervisors and Enumerators	Diploma or secondary school certificate with relevant field training	Experience in household, demand and socio-economic data collection in project areas	As required
			Total non-key experts (excluding field survey staff)	**20**

Note: The Team Leader/Project Manager (K1) represents the firm or consortium, is responsible for overall contract delivery and quality assurance, and leads and coordinates the expert team. The expert positions listed above are indicative. Consultants are free to propose their own team composition and any additional expertise they consider necessary, based on their best understanding of the assignment, provided that all the required areas of expertise are adequately covered and the proposed staffing is fully justified in the technical proposal. Local content (see Section 5.3) will be considered an added advantage in the evaluation of proposals: bidders that include qualified

national experts in key and non-key positions, associate with local firms as consortium members or sub-consultants, and engage local survey and support staff will be viewed favourably.

4.2.3 The Consultant shall define the responsibilities of each expert. Replacement of key experts shall require prior Client approval in accordance with the contract. The key experts in Table 5 are the only key-expert requirements for the assignment and apply to all workstreams described in Annexes I to III.

5. SELECTION METHOD AND EVALUATION

5.1 The Consultant will be selected using the Quality- and Cost-Based Selection (QCBS) method in accordance with the African Development Bank's Procurement Policy for Bank Group Funded Operations and the Methodology for its implementation, as applicable under the financing agreement, using the Bank's Standard Request for Proposals. Eligibility, the establishment of the short list and the selection procedure shall conform to these requirements.

5.2 Short-listing will be based on the general experience of the firm or consortium, its specific experience in similar assignments (feasibility studies, detailed design, ESIA and RAP for transmission and distribution projects), and its experience in similar conditions in Sub-Saharan Africa.

5.3 To encourage local content, the technical evaluation in the RFP will include a criterion for participation of Sierra Leonean nationals among the proposed key experts. Association with Sierra Leonean consulting firms is encouraged.

5.4 Conflict of interest: the Consultant, including its consortium members, sub-consultants and affiliates, shall be disqualified from providing goods, works or non-consulting services resulting from or directly related to the designs and bidding documents prepared under this assignment.

5.5 Integrity: the Consultant shall observe the highest standards of ethics during selection and execution of the contract. The AfDB's rules on corrupt, fraudulent, collusive, coercive and obstructive practices and its sanctions procedures apply.

6. PAYMENT TERMS

6.1 Payments will be made against the milestones below, following submission and written acceptance of the relevant deliverable by the Client and receipt of a valid invoice. The deliverables are defined in Section 3.10.

Milestone	**Payment trigger**	**Payment**
1	Acceptance of D1 – Inception Report	15%
2	Acceptance of D2 – Interim Report	40%
3	Acceptance of D3 – Draft Reports	30%
4	Acceptance of D4 – Final Reports	15%
Total		**100%**

7. CLIENT RESPONSIBILITIES

- Provide available project documents, data, studies and technical information.
- Confirm project locations, interventions, design parameters and scope during inception.
- Facilitate site access and introductions to agencies and stakeholders where practicable.

- Designate a Project Coordinator and technical focal persons.
- Provide consolidated comments and decisions within fourteen (14) calendar days of receipt of each deliverable (Section 3.10).
- Coordinate national approvals, transmit deliverables to AfDB and obtain the Bank's no-objection where required.
- Review and formally accept deliverables in accordance with the contract.

8. QUALITY ASSURANCE

a. The Consultant shall establish and implement appropriate quality assurance and quality control procedures to ensure the accuracy, completeness and consistency of all deliverables, including the consistency of the design and bidding documents of each line route with the feasibility, ESIA/ESMP, RAP and Gender Action Plan outputs for that route.
b. All engineering calculations, drawings, technical specifications, bills of quantities and cost estimates shall be checked by qualified professionals before submission.
c. The Grid Code compliance matrix shall be maintained and updated through the Design Stage, and any change in design criteria or system assumptions shall be documented, justified and agreed with the Client.

9. Reporting and Review

- The Client, EGTC, MoE and the PIU will review each deliverable and provide consolidated written comments within the review period stated in the contract; the Consultant shall address all comments in the next version and provide a comments-response table.
- Deliverables that require the AfDB's review or no-objection, including the draft and final bidding documents, shall be submitted through the Client; the Consultant shall allow for the AfDB's review time in the work plan.
- The Consultant shall present the key findings of the Interim Report (D2), Draft Report (D3) and Final Report (D4) to the Client and stakeholders, and shall record the decisions taken and any outstanding issues.

10. OWNERSHIP, CONFIDENTIALITY AND DATA

All reports, drawings, calculations, datasets, maps, models, cost estimates, photographs, survey records and other outputs shall be delivered to the Client and governed by the ownership and intellectual property provisions of the contract. The Consultant shall protect confidential information and shall not publish or disclose project information without prior written authorization from the Client, except as required by law or contract. Applicable data protection and informed-consent requirements shall be observed.

ANNEX I:

TECHNO-ECONOMIC FEASIBILITY STUDIES, DETAILED ENGINEERING DESIGN AND PREPARATION OF BIDDING DOCUMENTS FOR THE PROPOSED 66 KV AND 33 KV TRANSMISSION LINES AND SUBSTATIONS UNDER THE SIERRA LEONE RURAL ELECTRIFICATION ACCESS PROJECT (SLREAP)

1. OBJECTIVES OF TECHNO-ECONOMIC ANALYSIS

1.1 Overall objective

The overall objective of the section is to provide professional Techno-economic consultancy services that (i) determine, for each line route, the technical, economic and financial feasibility of the proposed SLREAP investments in compliance with the Sierra Leone Grid Code, and rank the line routes to inform the prioritisation of resources; and (ii) prepare detailed designs, technical specifications, bills of quantities, cost estimates and complete bidding documents, packaged separately for each line route, so that every route is ready for procurement.

The assignment is carried out in two stages: the Preliminary Stage (Up to D3), which covers the techno-economic studies, preliminary design considerations, route and site options and route prioritisation, and the Design Stage (Section 4), which covers the detailed engineering design and the preparation of the tender packages (bidding documents). The line routes, line segments and substations covered are those listed in the General Terms of Reference (lines in Section 2.3 and substations in Section 2.5). The deliverables are the D1 Inception Report, D2 Interim Report, D3 Draft Report and D4 Final Report set out in Table 4 of the General Terms of Reference; the outputs expected under each of them are summarised in Section 5.

The network maps at the end of this Annex show the context of the assignment: Figure 1 shows the Sierra Leone network with the proposed 66/33 kV transmission and distribution lines and associated substations overlaid on a Google map; Figure 2 is a line diagram showing the proposed take-off points, substations and line routes; and Figure 3 shows the Sierra Leone grid network with the current and proposed transmission and distribution lines. The figures are indicative and are provided for orientation only. The line routes, line segments and substations listed in Sections 2.3 and 2.5 of the General Terms of Reference prevail where they differ from the figures, and the Consultant shall verify and update the figures during the assignment (Sections 3.1, 3.2 and 3.5.1).

1.2 Specific objectives of the Pre-Feasibility Stage

a. Review available power-sector data, plans and studies and establish a reliable baseline for the feasibility assessment.
b. Verify on the ground the line segments listed in Section 2.3 and the substations listed in Section 2.5 of the General Terms of Reference, establish the preferred alignment of each line and the exact site of each substation, and verify the network components and communities for each line route in coordination with EDSA, EGTC, the PIU and the ESIA, RAP and gender workstreams, and determine the number of communities to be electrified.

c. Assess how the proposed investments integrate with existing and planned generation, transmission, distribution, communications, SCADA and national dispatch/control systems, and demonstrate compliance with the Sierra Leone Grid Code.
d. Undertake network planning and system studies over a 20-year planning horizon, with study cases at five-year intervals, carry out technical studies of each new or extended substation, and identify required reinforcements and mitigation measures.
e. Compare technically feasible and least-cost alternatives for electrifying the identified communities, including conventional MV/LV grid extension and shield-wire or other options where technically appropriate.
f. Prepare preliminary design considerations, route options and recommendations, route maps, indicative quantities, cost estimates and an indicative implementation schedule for each line route, at the level required for the techno-economic analysis and ranking. Detailed engineering design shall be carried out once, in the Design Stage (Section 4); the preliminary design considerations are not a separate design stage.
g. Determine economic and financial viability, financing needs, affordability and sustainability, including relevant return indicators, sensitivity and risk analysis.
h. Recommend suitable institutional and commercial arrangements for project implementation, operation and maintenance.
i. Identify and quantify environmental and social design constraints and integrate the findings, mitigation costs and schedule requirements of the ESIA, ESMP and RAP for each line route.
j. Rank the line routes by techno-economic impact, in consultation with the Client, presenting a comparative ranking in the Interim Report (D2), updating it in the Draft Report (D3) once the economic and financial analysis is complete, and issuing the final Route Prioritisation Report in the Final Report (D4), to inform the prioritisation of resources and the sequencing of implementation. All line routes will be studied, a feasibility study (FS) report will be submitted for each, and all are expected to proceed to detailed design and construction; no line route shall be dropped as a result of the ranking.
k. Transfer the network models, economic and financial models, GIS datasets and other analytical tools to the Client in editable form, with user documentation and hands-on training for EDSA, EGTC and PIU staff.

1.3 Specific objectives of the Design Stage

The Design Stage shall deliver detailed designs, technical specifications, bills of quantities, cost estimates and complete bidding documents, packaged separately for each line route, for all the line segments listed in Section 2.3 and all the substations listed in Section 2.5 of the General Terms of Reference.

The specific objectives of the Design Stage are to:

a. assess the existing electrical infrastructure and identify the requirements for the proposed works;
b. conduct the necessary field surveys, technical investigations and engineering assessments;
c. develop detailed engineering designs for the proposed substations and the transmission and distribution lines, in compliance with the Sierra Leone Grid Code, addressing in particular drainage and substation foundations, access routes to substations, connectivity of transmission

and distribution lines, linkage with existing networks and the national grid, and substation fencing and accommodation for operators;

d. prepare technical specifications, drawings, bills of quantities and cost estimates for each line route;
e. prepare complete bidding documents for each line route in accordance with the AfDB Procurement Policy for Bank Group Funded Operations and the Bank's Standard Bidding Documents; and
f. incorporate environmental, social, health, safety and climate-resilience considerations into the design and bidding documents.

2. REGULATORY FRAMEWORK, STANDARDS AND GRID CODE COMPLIANCE

2.1 Applicable legal, regulatory and technical framework

The Consultant shall carry out all services under this assignment in accordance with internationally recognised practice for consultancy services and, as a minimum, with the following:

- the National Electricity Act, 2011, the Sierra Leone Electricity and Water Regulatory Commission Act, 2025, and the regulations, licence conditions, codes, guidelines and tariff determinations issued by the Sierra Leone Electricity and Water Regulatory Commission (the "Regulator") under them;
- the Sierra Leone Grid Code and the Distribution Code, Metering Code and any other technical code approved by the Regulator, in the versions in force at the date of commencement of the assignment (see Section 2.2);
- applicable national energy and development policies and plans, including the national electrification and power-system development plans, the National Energy Compact and the Medium-Term National Development Plan 2024–2030;
- applicable national environmental, land and social legislation, including the Environmental Protection Agency Act, 2022 and the Customary Land Rights Act, 2022;
- for assets connected to, or affected by, the CLSG interconnection, the applicable West African Power Pool (WAPP) operating and planning requirements and ECOWAS Regional Electricity Regulatory Authority (ERERA) rules;
- the requirements of the AfDB and of the financing agreement, including those on economic analysis, environmental and social safeguards and procurement; and
- relevant IEC, IEEE, CIGRÉ and other recognised international standards, together with EDSA and EGTC utility standards and MoE requirements.

2.2 Sierra Leone Grid Code compliance

- At inception, confirm with EDSA, EGTC and the Regulator the version of the Grid Code and related codes that applies, and any approved or pending amendments, and identify the provisions relevant to the assignment (planning, connection, operation, protection, metering, SCADA/communications, data exchange and power quality).
- Apply the Grid Code requirements as acceptance criteria for all system studies, including the declared voltage and frequency limits, thermal ratings, security (N-1) criteria, fault-level limits,

reactive-power and power-factor requirements and power-quality limits. Where the Grid Code is silent or ambiguous, propose criteria based on recognised international practice and agree them with EDSA, EGTC and the Regulator before use.

- Prepare, for each line route, a Grid Code compliance matrix showing each relevant requirement, the study or design measure that addresses it, and the result. Any non-compliance, required derogation or recommended Grid Code clarification shall be reported explicitly; no derogation shall be assumed without the written agreement of the Client and the Regulator.
- Assess the connection of each new substation and line to the existing EGTC and EDSA networks against the Grid Code connection conditions, and identify the technical data, single-line diagrams, line and transformer parameters and other information that will be needed for connection agreements and for any licence application to the Regulator for the new transmission assets, so that they can be reused without rework.
- Confirm that the SCADA, telecommunications, protection and metering concepts are compatible with the Grid Code and with the national dispatch/control centre requirements, and that the network remains secure under CLSG import, export and transit conditions.

2.3 Order of precedence and conflicts

The laws of Sierra Leone, the Grid Code and the other codes approved by the Regulator shall prevail over other requirements. Where the requirements of the AfDB, the financing agreement, utility standards or international standards differ from one another, the Consultant shall notify the Client in writing, apply the more stringent requirement pending the Client's written decision, and record the decision in the Inception Report or the next progress report.

3. DETAILS OF EXPECTED OUTPUTS IN D1 TO D3

The Consultant shall undertake the Feasibility Stage in compliance with Section 2, international standards, the applicable laws and regulations of Sierra Leone and applicable AfDB requirements. The tasks below shall be performed for each line route and coordinated with the ESIA/ESMP, RAP and gender workstreams (Section 3.11) and with the Design Stage (Section 4). The list is not exhaustive; the Consultant shall perform any additional work necessary to meet the objectives in Section 1.2.

3.1 Inception and review of available information

- Review the available project concept, approved documents, national electrification plans, system development plans, previous rural electrification and transmission studies, network maps, load forecasts, generation and interconnection plans, and other relevant materials.
- Hold an inception meeting with the Client, EGTC, MoE, the PIU and the Regulator, as appropriate, and agree the methodology, work plan, data requests, study criteria, modelling assumptions, reporting formats and review procedures.
- Prepare an Inception Report that includes the Grid Code provisions identified under Section 2.2, the confirmation of the line routes and line segments listed in Section 2.3 and the substations listed in Section 2.5 of the General Terms of Reference, the planning and design criteria to be applied, the data gaps and the updated work plan.

3.2 Data collection, review and baseline assessment

- Review existing and planned generation and transmission facilities, expansion plans, projected power imports through the Côte d'Ivoire–Liberia–Sierra Leone–Guinea (CLSG) interconnection, current operating conditions and relevant cross-border exchanges.
- Collect and review single-line diagrams, substation layouts, site plans, protection schemes, circuit-breaker ratings, conductor sizes, tower designs, communication and SCADA arrangements, operating data, maintenance records, outage information and the condition of existing assets at the connection points.
- Review existing tower and conductor testing reports for 66 kV and 33 kV lines and assess their suitability for the project in consultation with EDSA and EGTC.
- Compile geospatial data (GIS) on settlements, roads, existing networks, land use and protected or sensitive areas along each line route.
- Use the network maps and line diagram in Figures 1 to 3 as the starting reference for the GIS base map. Check them against the data collected and the field verification, and submit corrected and updated maps and line diagrams, consistent with the confirmed line routes, in the Interim Report (D2).
- Undertake field visits and verification surveys as required to validate the proposed routes, substation sites, community locations, access conditions and existing infrastructure.
- Where data are unavailable, use transparent and justified assumptions based on acceptable engineering practice. Record the source, date, limitation, assumption and sensitivity of each material input in a data register.

3.3 Demand forecast and load assessment

- Gather load, load-factor, demand forecast, population, electricity-access, market-trend and energy-supply information, including demand from public facilities, commercial and industrial users, mining companies and other large customers.
- Prepare base, low and high demand forecasts over the 20-year planning horizon, by customer category and by substation and line route, stating the assumptions on connection rates, consumption per customer, load growth, load factor, diversity, large and productive loads and the impact of tariffs on affordability.
- Reconcile the forecasts with national and utility forecasts and system development plans, and explain any material differences.

3.4 Technical interconnection and power-system studies

The system model, base-case validation and the load-flow and N-1 screening needed to compare route and site options shall be reported in the Interim Report (D2). The remaining studies below shall be completed, and the full results reported, in the Draft Report (D3), so that the equipment ratings and design criteria used in the detailed design rest on completed studies.

- Develop or update a power-system model in consultation with EDSA and EGTC, using industry-standard software (such as PSS®E), and use it to assess the integration of SLREAP into the existing and planned national system. The assessment shall cover a 20-year planning horizon with cases at five-year intervals and shall consider relevant generation, transmission, distribution,

interconnection and load scenarios, including peak, off-peak, wet-season and dry-season (hydropower availability) conditions and CLSG import, export and transit conditions.

- Validate the base-case model against measured operating data where available and document the validation.
- Perform load-flow studies to determine power flows, voltage profiles, transfer capacity, thermal loading and system losses under normal and N-1 contingency conditions, against the Grid Code criteria.
- Undertake static, dynamic and transient stability studies, including assessment of inter-area oscillations and stability margins, and recommend mitigation measures where required.
- Calculate fault levels (three-phase and earth-fault) and assess the adequacy of existing and proposed circuit breakers, protection systems, earthing arrangements and equipment ratings, including protection coordination with the existing network.
- Assess system security and operating performance during disturbances; examine the need for voltage control, transformer tap-changing, reactive compensation, power-system stabilisers, capacitor banks, SVCs or other appropriate measures.
- Conduct switching and overvoltage studies, including receiving-end voltage rise, lightning and switching overvoltages, insulation coordination and surge-arrester requirements.
- Assess power quality (voltage regulation, harmonics and flicker) at the new substations against the Grid Code and Distribution Code limits.
- Analyse technical losses under alternative power-transfer and import scenarios, using bulk energy-meter and operating data where available; assess potential loop flows and recommend technically and economically justified remedies.
- Assess supply reliability for each line route, including expected energy not served and relevant reliability indices, with and without the project.
- Review generation and transmission adequacy and identify national-level transmission or sub-transmission reinforcements required to enable the project and accommodate planned generation and interconnection flows.
- For each required reinforcement, provide a technical justification, preliminary scope, indicative cost, priority, dependency and implementation schedule.
- Provide the annual balance of forecast demand and supply over the planning horizon and state all assumptions concerning generation availability, imports, operating modes and network development.

3.5 Preliminary design considerations, route options and recommendations for lines and substations

The engineering work in this section is carried out at the level of preliminary design considerations. In the Interim Report (D2) the Consultant shall present, for each line route, the design criteria, the alignment options for each line and the site options for each substation, the technology and configuration options, the preferred option with reasons, preliminary single-line diagrams and layouts, indicative quantities and preliminary cost estimates, so that the Client can confirm the recommended alignments and sites before detailed design begins. These are refined in the Draft Report (D3). Detailed engineering design

(calculations, construction drawings, tower spotting, final specifications and bills of quantities) is not part of this section and shall be carried out once, in the Design Stage (Section 4).

3.5.1 Transmission and distribution lines: design considerations and route options

- For each line segment listed in Section 2.3 of the General Terms of Reference, develop alignment options between the listed end points, including alternatives where viable, taking account of technical performance, constructability, access, land use, settlements, sensitive receptors, environmental and social constraints, and lifecycle cost. Compare the options and recommend a preferred alignment for each segment, with the supporting comparison, in the Interim Report.
- Take the line routes and take-off points shown in Figures 1 to 3 as the starting point for the alignment options, and show clearly on the route maps where the recommended alignments differ from them.
- Define design criteria for 66 kV and 33 kV lines, including voltage and frequency, conductor type and configuration, current-carrying capacity, losses, clearances, insulation, reliability, maintainability, lightning protection, earthing, public safety and utility standards, consistent with the Grid Code.
- Assess single- and double-circuit configurations, conductor and insulator options, tower types, structural loading, foundations, soil and geotechnical conditions, right-of-way requirements, access and maintenance needs.
- Consider OPGW/fibre-optic communications and other communication requirements where technically justified; assess lightning performance, environmental conditions, corrosion, wind, pollution, humidity and soil conditions.
- Prepare route maps, indicative quantities and functional specifications for each line route as inputs to the cost estimates and techno-economic analysis. Line profiles, tower spotting, structure outlines and foundation designs shall be produced once, in the Design Stage (Section 4.1).
- Identify risks associated with route constraints, land access, constructability, material transport, safety and maintenance and propose practical mitigation measures.

3.5.2 Substations: design considerations and studies

The substations and switching stations listed in Section 2.5 of the General Terms of Reference (together with any extension of existing EGTC and EDSA substations at the connection points) are integral to the line routes and shall be studied as thoroughly as the lines. Their number, names, voltage levels and locations are as listed in Section 2.5; the studies determine the exact site, configuration and ratings of each. For each substation, the Consultant shall use the system-study results of Section 3.4 and the criteria agreed under Section 2.2 to carry out at least the following studies, presenting preliminary results, site and configuration options and recommendations in the Interim Report (D2) and completing the studies in the Draft Report (D3):

- **Capacity and staging:** for the voltage levels listed in Section 2.5 of the General Terms of Reference, determine the number of transformers and the MVA rating, based on the demand forecast, load-flow results, the N-1 (transformer redundancy) criteria and permitted loading of the Grid Code, with provision for future expansion and phased installation.

- **Configuration and layout:** compare busbar and bay arrangements at each voltage level, and AIS, GIS or hybrid options, on reliability, maintainability, safety, footprint and lifecycle cost; define the indicative single-line diagram and layout.
- **Short-circuit and equipment ratings:** calculate present and future fault levels, determine the ratings of transformers, circuit breakers, instrument transformers, isolators and busbars, and select the neutral earthing method at 66, 33 and 11 kV.
- **Voltage control and reactive power:** determine transformer impedance, tap-changer range and any shunt compensation needed to meet the Grid Code voltage and power-factor limits at the connection points.
- **Insulation coordination and overvoltage protection:** determine insulation levels, clearances, creepage distances for the local climate and pollution conditions, lightning shielding and surge-arrester requirements.
- **Earthing and safety:** carry out soil-resistivity measurements and an earth-grid assessment covering touch and step voltages and fault-current withstand.
- **Protection, control, metering and communications:** define the protection philosophy and coordination with the existing network, the control and metering concept (revenue and bulk metering to the Metering Code), and the SCADA and communications arrangements described in Section 3.5.3.
- **Auxiliary systems:** size the AC and DC auxiliary supplies, batteries and standby supply, and the fire detection, fire-fighting and security systems.
- **Site and civil assessment:** assess the candidate sites at the location listed in Section 2.5 of the General Terms of Reference (available area, topography, geotechnical conditions, flooding and drainage, access road, transformer oil containment, control building and operators' accommodation) together with environmental, social and land constraints, and recommend the preferred site; where no suitable site exists at the listed location, submit a reasoned recommendation to the Client, and no change to the listed location shall be adopted without the Client's written approval.
- **Existing substations:** assess the condition, space and capacity of existing substations at the connection points and identify the extensions or reinforcements needed to accommodate SLREAP.
- **Outputs:** a preliminary data sheet for each substation (design basis, recommended site and configuration, preliminary single-line diagram, indicative layout, equipment list, indicative quantities, cost estimate and Grid Code compliance entry) in the Interim Report (D2), updated in the Draft Report (D3) as input to the cost estimates, the techno-economic analysis and the detailed design. Detailed substation design shall be produced once, in the Design Stage (Section 4.3).

3.5.3 Protection, communications and SCADA

- As an input into the studies, review existing communications, tele-protection, SCADA and national dispatch/control centre arrangements and determine their adequacy for the proposed network.

- Develop an integration concept that enables monitoring and control (both remote and local) of the new facilities and is compatible with existing utility systems and Grid Code data-exchange requirements.
- Consider fibre-optic transmission using OPGW as a primary communications channel (between primary and secondary substations) and power-line carrier (PLC) as a backup where technically feasible and justified.
- Define preliminary requirements for protection relays, control and monitoring, tele-protection, communication interfaces, cybersecurity considerations, data points, revenue and bulk metering, and control-centre integration.
- Identify necessary upgrades, indicative quantities, functional specifications, cost estimates, training and operational requirements.

3.6 Electrification of identified communities

- Review the Government-proposed list of communities and verify each community's location, population, current access, demand, public infrastructure, productive-use potential and eligibility under the project.
- Estimate demand over the planning horizon for households, local administration, schools, health facilities, water-supply installations, small enterprises, commercial and industrial users and other relevant loads.
- For each community, compare feasible options, including conventional medium-voltage outlets and MV/LV distribution from project substations, extensions from nearby distribution systems, shield-wire technology (SWS) and other options only where technically justified and consistent with the approved project concept.
- Assess each option using technical feasibility, service quality, reliability, lifecycle cost, capital and operating cost, losses, connection costs, street lighting, environmental and social implications, operation and maintenance requirements and expected development benefits.
- Recommend the least-cost technically feasible option for each community and provide the reasoning, assumptions, advantages, disadvantages and sensitivity of the recommendation.
- Determine, for each line route, the number of communities to be electrified, the likely customer connections and street lighting. The figures of about 60 communities, 88,000 connections and street lighting in about 120 communities are indicative only.
- Prepare functional specifications, indicative quantities and cost estimates for each selected solution, with community costs shown separately and included in the consolidated project cost; detailed designs and bills of quantities shall follow in the Design Stage (Section 4).
- Identify communities that may not meet eligibility or technical criteria and submit evidence and recommendations to the Client for decision; do not remove or replace a community without written Client confirmation.

3.7 Economic and financial analysis

A preliminary cost estimate and economic screening (indicative investment cost, cost per connection and preliminary economic return indicators) shall be reported in the Interim Report (D2) to support the route options and the preliminary route prioritisation. The full economic and financial analysis shall be

completed and submitted in the Draft Report (D3), together with the economic and financial models in editable form and with documentation of all assumptions, inputs and formulas.

- Prepare a component-based investment cost estimate for each line route covering transmission and distribution lines and substations, community electrification, customer connections, meters, street lighting, communications/SCADA, engineering and supervision, contingencies, taxes/duties where applicable, and the environmental and social measures identified in the ESIA, ESMP and RAP for that route. State the price base date, currency, exchange-rate and escalation assumptions.
- Develop a transparent "with project" and "without project" comparison, including counterfactual assumptions and a clear explanation of avoided costs and benefits.
- Estimate and compare capital, operating, maintenance, replacement and other relevant lifecycle costs for the project and feasible alternatives.
- Agree with the Client and the AfDB, at inception, the evaluation period, discount rate, conversion factors/shadow prices and valuation of benefits (including consumer surplus, avoided costs of alternative supply and the value of unserved energy) to be used in the economic analysis.
- Calculate Economic Net Present Value (ENPV), Economic Internal Rate of Return (EIRR), Financial Net Present Value (FNPV) and Financial Internal Rate of Return (FIRR), where appropriate to the project data and agreed methodology.
- Undertake sensitivity and switching-value analyses for material variables, including capital costs, operating costs, demand/load factor, losses, revenue collection, generation/fuel costs, import/transit assumptions, financing costs and implementation delays.
- Assess affordability, financial sustainability, revenue and cost recovery implications (taking account of the tariffs and tariff determinations of the Regulator), financing needs and the rationale for public financing. Develop an indicative financing plan in consultation with the Client and relevant financing partners.
- Assess a proposed levelized transmission cost (LTC) or equivalent cost-recovery measure if relevant, clearly stating assumptions, methodology, limitations and implications for financial viability.
- Conduct distributional analysis of costs and benefits across stakeholder groups and discuss wider development impacts for Sierra Leone and, where relevant, the Mano River Union region.
- Assess the potential applicability of carbon finance or other climate-related financing mechanisms and estimate greenhouse-gas impacts using the applicable AfDB methodology and guidance confirmed for the assignment.
- Present the economic and financial analysis separately for each line route, including ENPV, EIRR, FNPV, FIRR, cost per connection and sensitivity results, together with a comparative summary to update the route ranking of Section 3.12 in the Draft Report (D3).

3.8 Institutional and implementation framework

- Review the existing sector institutional framework, the roles of EDSA, EGTC, MoE, the Regulator and other relevant bodies, sector reforms and relevant national and regional arrangements, including asset ownership and licensing implications for the new transmission assets.

- Compare implementation and operating models used in comparable power-sector and regional interconnection projects, including relevant examples in the Mano River Union and West African Power Pool context.
- Recommend practical arrangements for project governance, design review, procurement, implementation, supervision, asset ownership, commissioning, operations and maintenance, coordination and reporting.
- Identify agreements, protocols or legal instruments that may be required to implement the recommended framework and provide outlines or draft concepts where specifically agreed with the Client; legal advice beyond the Consultant's competence shall be identified as requiring specialist input.
- Present the proposed framework to the Client and stakeholders for review and record decisions, outstanding issues and recommended actions.

3.9 Commercial and operational sustainability framework

- Assess the commercial arrangements required for sustainable implementation and operation of SLREAP, including responsibilities for supply, transmission, distribution, customer connection, metering, billing, revenue collection and maintenance.
- Identify relevant interfaces with existing utility operations, power purchase or supply arrangements, interconnection and wheeling arrangements where applicable, and arrangements for large customers.
- Assess risks to revenue collection, affordability, losses, customer service, operation and maintenance financing and service sustainability.
- Recommend a practical commercial framework with defined responsibilities, operating assumptions, key agreements to be considered and a plan for further development during project preparation.

3.10 Project risk analysis and implementation strategy

- Develop a risk register for each line route covering technical, financial, economic, institutional, legal, regulatory, procurement, schedule, operational, stakeholder, environmental, social, climate and external risks, including risks during the defects liability (warranty) period.
- Categorise risks by source, nature, internal/external status, probability, impact and responsible party, and suggest mitigating measures.
- Quantify material risks, using Monte Carlo simulation or another suitable method where data permit; otherwise provide a transparent qualitative assessment and explain its limitations.
- Assess potential impacts on cost, schedule, technical performance, commissioning, service quality, operating performance and revenue assumptions.
- Propose risk responses, contingency measures, trigger indicators, responsible entities and monitoring arrangements.
- Prepare an integrated implementation strategy and schedule identifying the critical path, major milestones, procurement packages, required approvals and licences (including any licence or connection approvals required from the Regulator), land and access dependencies, network reinforcement dependencies and the commissioning sequence.

3.11 Integration of engineering, environmental, social and gender workstreams

- Hold regular coordination meetings between the engineering, economic, ESIA, RAP and gender teams and share route maps, site layouts, alternatives, demand and cost information through a common project database.
- Make engineering information available in time for environmental and social screening, baseline work, impact assessment, stakeholder engagement, land requirements and consideration of alternatives for each line route.
- Incorporate agreed environmental and social constraints and mitigation requirements into route selection, functional specifications, cost estimates, the implementation schedule and the risk register.
- Ensure consistency between the feasibility study, designs, ESIA/ESMP, RAP and Gender Action Plan for each line route, and maintain an interface register documenting data exchanged, decisions, unresolved matters and responsible team members.
- Include the costs and schedule implications of the environmental, social, resettlement and gender measures in the consolidated feasibility analysis of each line route.

3.12 Route prioritisation

- Propose, for the Client's approval at inception, a transparent ranking methodology that combines the economic and financial results with technical, social, environmental, readiness and strategic criteria, including ENPV/EIRR, cost per connection, number of communities and population served, demand and productive-use potential, loss reduction and reliability improvement, Grid Code compliance and reinforcement needs, environmental, land and resettlement risk, implementation readiness and dependencies between routes.
- Agree the criteria and weights with the Client before scoring and test the robustness of the ranking through sensitivity analysis. Present the comparative ranking in the Interim Report (D2), using the preliminary cost estimates and economic screening; update it in the Draft Report (D3) once the full economic and financial analysis is complete; and issue the final Route Prioritisation Report in the Final Report (D4).
- Use the ranking only to recommend the prioritisation of resources and the sequencing of implementation. All line routes shall proceed to full feasibility reports and detailed design; no route shall be dropped as a result of the ranking.

3.13 Knowledge transfer and capacity building

- Identify staffing, skills, systems, training and institutional capacity requirements and estimate the associated costs where feasible.
- Provide training for at least 10 personnel on the financial model, the power-system model (using PSS®E) and other agreed tools, including user manuals and editable source files, to designated EDSA, EGTC and PIU staff.
- Hand over all models, GIS datasets, data registers and analytical tools in editable form, with the licences or open-format equivalents needed for the Client to continue to use them.

4. EXPECTED OUTPUTS IN D3 AND D4 - DETAILED DESIGN AND BIDDING DOCUMENTS (DESIGN STAGE).

The Design Stage builds on the baseline data, load forecasts, network studies, recommended alignments and sites, preliminary design considerations and cost estimates established in the Feasibility Stage and accepted by the Client at the Interim Report (D2) stage, and shall not repeat that work.

4.1 Detailed engineering design of transmission lines

The Consultant shall prepare detailed engineering designs for the proposed transmission lines, covering the voltage levels and line sections of each line route. The services shall include:

- determination of conductor requirements based on the load-flow results of the Feasibility Stage;
- conductor sizing and electrical performance calculations;
- selection of appropriate conductor types, insulators and line hardware;
- design of transmission line towers or poles, including structural requirements;
- design of tower or pole foundations based on the relevant site and soil conditions;
- sag-and-tension calculations and conductor clearance assessments;
- insulation coordination, and earthing and lightning protection system design;
- aerial warning lighting for transmission lines, where required;
- assessment of electrical losses and voltage performance against Grid Code limits;
- identification of crossings and clearances at roads, rivers, buildings, communication lines and other utilities;
- preparation of plan-and-profile drawings, route layouts, structure schedules and construction details; and
- preparation of material schedules and technical specifications.

The design shall comply with the Sierra Leone Grid Code, MoE/EDSA/EGTC requirements and recognised international standards.

4.2 Detailed engineering design of distribution lines

The Consultant shall prepare detailed designs for the proposed medium-voltage and low-voltage distribution networks, as applicable, in line with the option selected for each community under Section 3.6. The services shall include:

- assessment of existing and projected distribution loads;
- design of medium-voltage and low-voltage overhead or underground distribution lines, as applicable;
- selection of suitable conductors, cables, poles, insulators and associated hardware;
- design and sizing of distribution transformers, where included in the project;
- design of transformer installations, switching arrangements and protection systems;
- design of distribution network configurations and connection arrangements;
- voltage-drop and power-loss calculations against Distribution Code limits;
- short-circuit and protection coordination studies, where required;
- design of earthing and grounding systems;

- design of service connections and other associated distribution facilities, where applicable;
- design of street lighting for the communities included in the project; and
- preparation of detailed construction drawings, line layouts, single-line diagrams and material schedules.

4.3 Detailed engineering design of substations

The Consultant shall prepare the detailed design of each substation and switching station, building on the substation studies and the recommended sites and configurations in Section 3.5.2. The services shall include:

- site layouts, single-line diagrams, equipment arrangements and sections;
- civil works, including site preparation, foundations, drainage, access roads, oil containment, control building, fencing and accommodation for operators;
- transformer installations and associated switchgear (circuit breakers, isolators and instrument transformers);
- protection, control and automation systems;
- metering, including revenue and bulk metering to the requirements of the Metering Code;
- earthing and lightning protection systems;
- AC and DC auxiliary supplies, and fire detection, fire-fighting and security systems;
- communication and SCADA systems, compatible with the national dispatch/control centre and Grid Code data-exchange requirements; and
- connections to, and any extension of, existing substations and electricity networks.

The substation designs shall cover all the substations and switching stations listed in Section 2.5 of the General Terms of Reference, and shall comply with the Sierra Leone Grid Code and recognised international standards.

4.4 Preparation of technical specifications

The Consultant shall prepare comprehensive technical specifications covering all construction, equipment, materials, installation activities, testing, commissioning and performance requirements. The specifications shall address:

- technical and performance requirements, including the Grid Code connection and performance requirements applicable to each facility;
- manufacturing and quality standards, based on IEC and other recognised international standards and EDSA/EGTC utility standards;
- inspection and testing procedures, including factory acceptance testing, where applicable;
- transportation, handling, storage and installation requirements;
- construction quality assurance and quality control;
- site acceptance testing and commissioning, including the tests required for connection to the grid;
- health, safety and environmental requirements;
- warranty, defects liability and maintenance requirements;
- required operation and maintenance manuals; and

- training requirements during and after implementation, where applicable.

The technical specifications shall be clear, measurable and suitable for competitive procurement without unnecessarily restricting competition.

4.5 Preparation of bills of quantities and cost estimates

The Consultant shall prepare detailed bills of quantities (BoQs) for the proposed works of each line route, including:

- conductors and cables;
- poles, towers and associated structures;
- insulators, fittings and line accessories;
- foundations and civil works;
- transformers and switching equipment;
- protection, control and metering equipment;
- SCADA and communication control systems;
- earthing and lightning protection materials;
- DC systems;
- fire detection and fighting systems;
- security and surveillance systems;
- installation, erection and construction activities;
- training and capacity building;
- testing and commissioning; and
- other incidental works necessary for the completion of the project.

The Consultant shall also prepare a detailed engineer's cost estimate for each line route based on prevailing market prices, applicable taxes and duties, transportation costs, installation costs and other relevant project expenditures. The cost estimate shall include the assumptions, unit rates, quantities and pricing basis used in its preparation, and shall be reconciled with the Feasibility Stage cost estimate, with any material differences explained.

4.6 Preparation of bidding documents

The Consultant shall prepare complete bidding documents, packaged separately for each line route, for the procurement of contractors to undertake the proposed substations and transmission and distribution networks. The draft bidding documents, including the recommended contract type (for example, plant design, supply and installation) and the lotting for each line route, shall be submitted in the Draft Report (D3). The final bidding documents, organised as tender package volumes and incorporating all Client and AfDB comments, shall be submitted in the Final Report (D4). The bidding documents shall include, as applicable:

a. Invitation for Bids;
b. Instructions to Bidders;
c. Bid Data Sheet;
d. eligibility and qualification requirements;
e. evaluation and qualification criteria;

f. bidding forms and schedules;
g. technical specifications;
h. detailed engineering drawings;
i. bills of quantities and pricing schedules;
j. Employer's Requirements or technical requirements;
k. General Conditions of Contract;
l. Particular Conditions of Contract;
m. contract forms and agreement;
n. environmental, social, health and safety requirements;
o. implementation schedule and completion milestones;
p. testing, commissioning and acceptance requirements, including Grid Code compliance tests;
q. defects liability and warranty provisions; and
r. Performance Bond, Advance Payment Guarantee, Bid Security and any other contractual security that the Client may deem required.

The bidding documents shall be based on the AfDB Standard Bidding Documents applicable to the selected contract type and shall comply with the AfDB Procurement Policy for Bank Group Funded Operations and the applicable laws of Sierra Leone, as provided in the financing agreement. Each tender package shall be organised in volumes following the structure of the applicable Standard Bidding Document (for example: Volume 1, bidding procedures and forms; Volume 2, Employer's Requirements, including technical specifications, drawings and schedules; Volume 3, conditions of contract and contract forms; and Volume 4, environmental and social requirements), and shall be submitted in editable form as well as in the agreed final format.

5. DELIVERABLES AND REPORTING

5.1 Expected outputs per deliverable

The deliverables for the assignment, D1 Inception Report, D2 Interim Report, D3 Draft Report and D4 Final Report, and the timing of their submission are set out in Table 4 of the General Terms of Reference, which is the sole schedule of deliverables. The table below states the outputs expected from the engineering and economic work described in this Annex under each of those deliverables. Every output described in Sections 3 and 4 forms part of one of the four deliverables and is not a separate deliverable. Route-level outputs shall be submitted as separate volumes for each line route. Reports, drawings, models and datasets shall be submitted in editable electronic form as well as in the agreed final format.

Ref.	Deliverable	Expected outputs under this Annex I
D1	Inception Report	• the methodology and detailed work plan for the engineering and economic studies, including the survey and data-collection programme and the data requests (Sections 3.1 and 3.2); • the confirmation of the line routes and line segments listed in Section 2.3 and the substations listed in Section 2.5 of the

		General Terms of Reference, and the grouping of communities and anchor customers into line routes; • the Grid Code provisions identified, and the planning and design criteria and modelling assumptions agreed with the Client (Section 2.2); • the economic evaluation parameters (Section 3.7) and the route prioritisation criteria and weights (Section 3.12) agreed with the Client and the AfDB; and • the data gaps and data register, the quality-assurance plan and annotated outlines of the Interim, Draft and Final Reports.
D2	Interim Report	• the baseline data and assessment for each line route, including the field verification findings (Section 3.2); • the demand forecast for each line route (Section 3.3); • the options analysis and preliminary design for each line route: route and site options with the preferred option, the system model with load-flow and N-1 screening, design criteria, indicative single-line diagrams and layouts, route maps, indicative quantities and preliminary substation data sheets (Sections 3.4 and 3.5); • the community electrification options and the recommended option for each community (Section 3.6); • the preliminary cost estimate and economic screening for each line route (Section 3.7); • the preliminary Grid Code compliance matrix (Section 2.2); and • the comparative ranking of the line routes (Section 3.12).
D3	Draft Report, for each line route	• the draft feasibility study, with the editable economic and financial models: the completed system studies, the refined engineering of lines, substations and community electrification, the economic and financial analysis, the institutional and commercial frameworks, the risk register and implementation strategy, the integration with the ESIA, RAP and gender workstreams, and the updated route ranking (Sections 3.4 to 3.12); • the design basis, survey reports and route maps supporting the detailed designs; • the detailed designs, drawings, technical specifications, bills of quantities and engineer's cost estimates (Sections 4.1 to 4.5); • the draft bidding documents, with the recommended contract type and lotting (Section 4.6); and

		• the updated Grid Code compliance matrix and a comments-response table for the comments on the Interim Report.
D4	Final Report, for each line route	• an Executive Summary Report and presentation covering the engineering and economic findings; • the final detailed feasibility study, including the technical, economic and financial analysis; • the final detailed designs and the final bidding documents, organised as tender package volumes (Section 4.6) and ready for issue to bidders, subject to the AfDB's no-objection; • the final Route Prioritisation Report (Section 3.12); • the editable files, models, GIS datasets and data registers, with user documentation, and the training records (Section 3.13); and • a comments-response table showing how all Client and AfDB comments on the Draft Report have been addressed.

Figure 1 SL Network Google map with overlap of the proposed 66/33kV TL and Distribution Lines and associated substations.

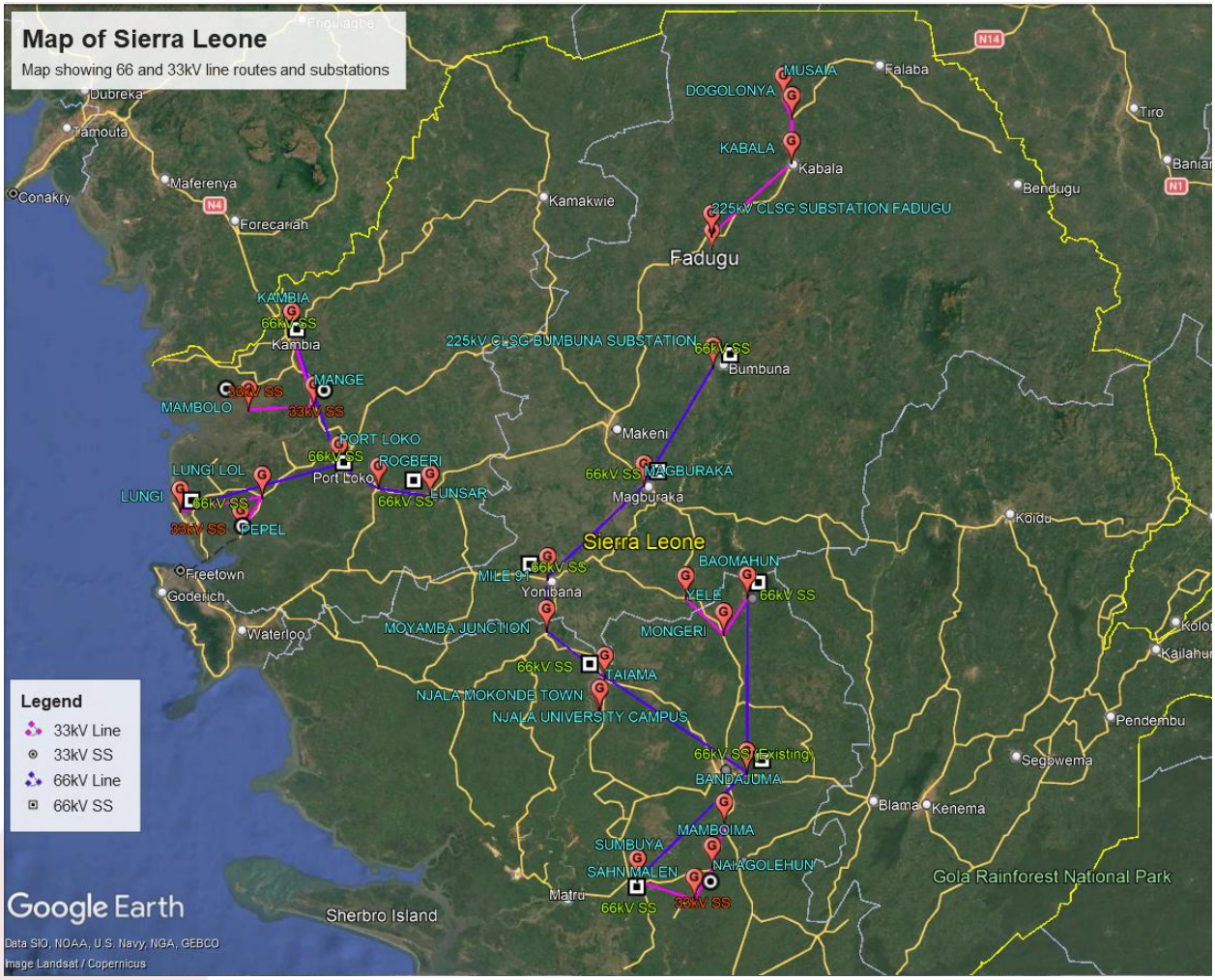


Figure 2 Line Diagram (LD) showing the proposed takeoff points, stations, and line routes

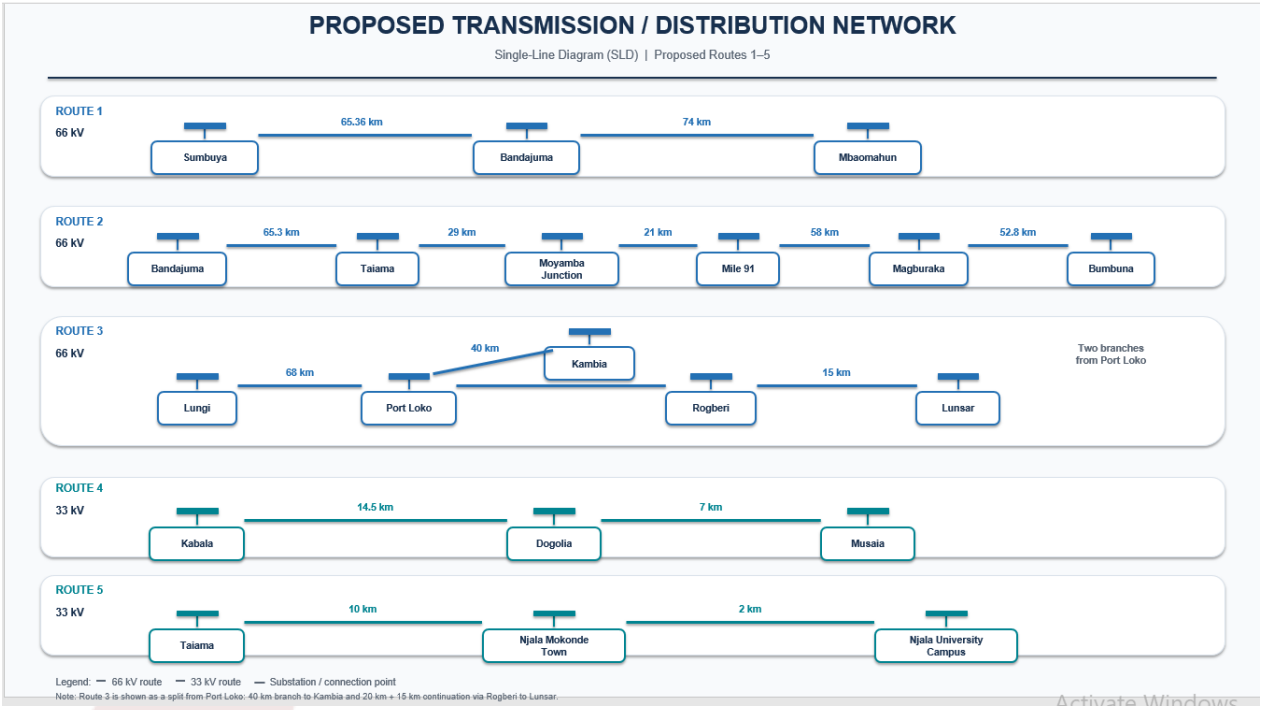
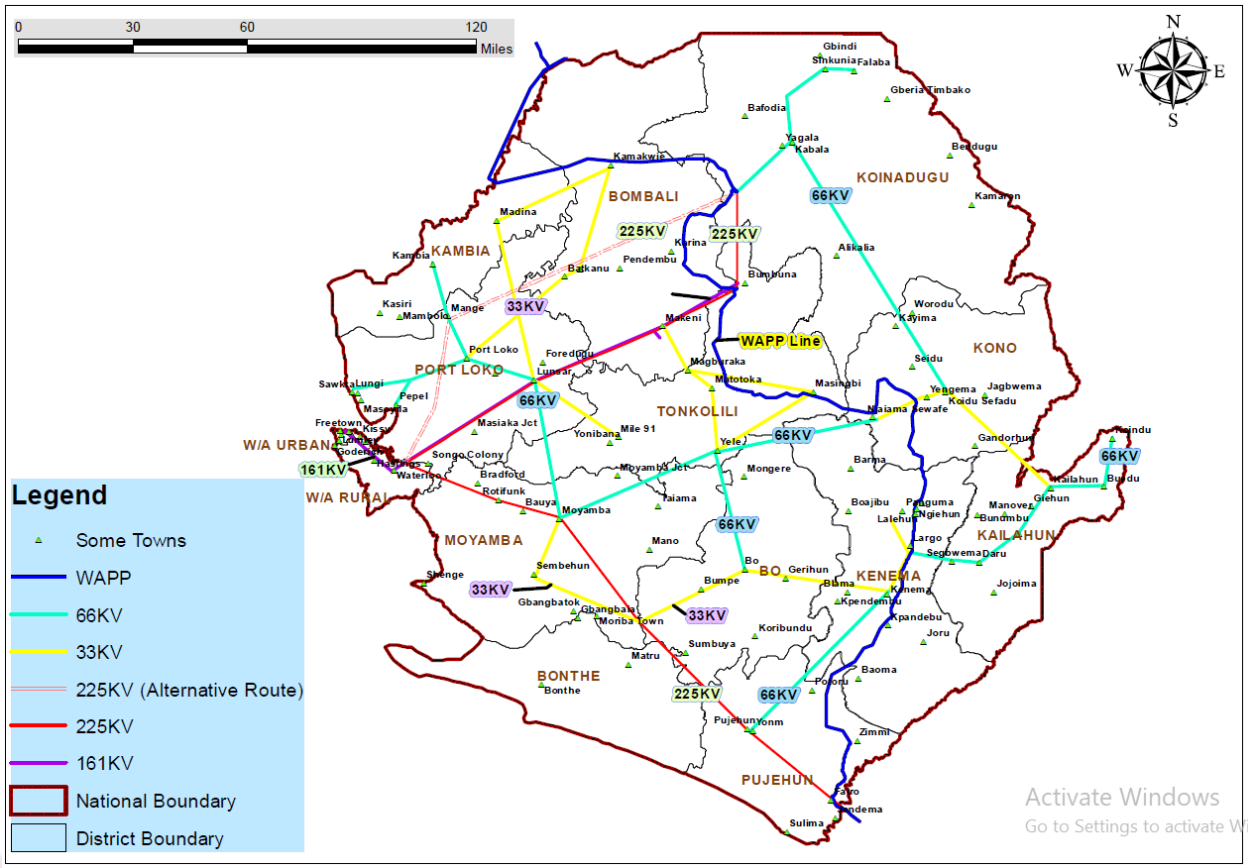


Figure 3: Map of SL Grid network showing current and proposed transmission and distribution lines



ANNEX II
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) AND ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP): SPECIFICATION OF DELIVERABLES

1. PURPOSE AND RELATIONSHIP TO THE GENERAL TERMS OF REFERENCE

1.1 Purpose

This Annex specifies the detailed content, format and quality requirements of the ESIA and ESMP deliverables. The objective and scope of the ESIA, the screening and scoping process, the coverage of the baseline, the required content of the ESMP and of the management plans, and the disclosure and licensing arrangements are set out in Section 3.5 of the General Terms of Reference and are not repeated here. This Annex shall be read together with the General Terms of Reference and, in the event of any inconsistency, the General Terms of Reference shall prevail.

1.2 Application

All deliverables in this Annex shall be prepared and submitted separately for each line route listed in Section 2.3 of the General Terms of Reference, covering the lines, the substations listed in Section 2.5 and any ancillary and associated facilities. Each line route shall have its own stand-alone ESIA and ESMP, so that every route can be reviewed, cleared and disclosed independently of the others. The deliverables are submitted with the D1 to D4 reports of Table 2 of the General Terms of Reference, as shown in Section 2 below, and are coordinated with the techno-economic and design work (Annex I) and with the Resettlement Action Plan (Annex III). The qualifications and inputs of the Consultant's staff, the delivery timelines, the payment milestones, the reporting lines, the facilities provided by the Client and the acceptance of deliverables are governed by the General Terms of Reference.

2. ESIA AND ESMP DELIVERABLES

For each line route the Consultant shall submit the following deliverables with the report indicated. The detailed content of each is specified in Section 3.

Ref.	Deliverable (per line route)	Principal content	Submitted with
ES1	Scoping Report	Area of influence of the corridor, each substation site and associated facilities; issues scoped in and out, with reasons; survey methods, locations and seasonal programme; alternatives to be assessed; additional instruments required; stakeholder list and consultation plan; draft Stakeholder Engagement Plan (SEP); status of the screening and scoping process with EPA-SL	D1 Inception Report
ES2	Baseline, Climate Risk and Alternatives Report	Field-verified baseline and sensitivity maps; climate risk and vulnerability assessment with prioritised adaptation measures; baseline on disadvantaged and vulnerable groups and indigenous peoples, where present; alternatives analysis for alignments and sites (Section 3.2). The findings shall be shared with the	D2 Interim Report

		Feasibility Stage team through the PIU as soon as available, to inform the choice of alignments and sites	
ES3	Draft ESIA Report	Complete ESIA structured as in Section 3.1, including the impact assessment (Section 3.3), the stakeholder engagement and consultation record (Section 3.4) and the draft ESMP; Executive Summary in English	D3 Draft Report
ES4	ESMP	Stand-alone document with the additional content in Section 3.5, in a form that can be incorporated in the bidding and contract documents; updated to reflect the detailed design	D3 Draft Report (draft) and D4 Final Report (final)
ES5	Final ESIA and ESMP package	Final ESIA and ESMP incorporating the comments of the PIU, AfDB and EPA-SL, with a comments-response table; English Executive Summary and local-language summary materials for consultation and disclosure; submission package for EPA-SL and AfDB; environmental and social requirements for the bidding documents (Annex I, Section 4.6)	D4 Final Report

3. SPECIFIC CONTENT REQUIREMENTS

3.1 Structure of the ESIA report

Each ESIA report shall contain, as a minimum:

a. a non-technical Executive Summary;
b. the policy, legal and institutional framework, including a gap analysis between national requirements and the AfDB requirements and the measures adopted to bridge the gaps;
c. a project description consistent with the current design, including construction methods, workforce and camps, access roads, sourcing of materials and associated facilities;
d. the environmental and social baseline of the area of influence, with sensitivity maps, as in ES2;
e. the analysis of alternatives (Section 3.2);
f. the impact assessment and the mitigation and enhancement measures (Section 3.3);
g. the stakeholder engagement and consultation record (Section 3.4);
h. the ESMP (Section 3.5) and the social management instruments (Section 3.6); and
i. annexes: maps, survey data, laboratory certificates, photographs, the list of the study team and the correspondence with EPA-SL.

3.2 Alternatives analysis, climate risk and baseline specifics

- **Alternatives:** The Consultant shall analyse alternatives for the alignment of each line and the location of each substation, building on the options developed in the Feasibility Stage (Annex I, Section 3.5), and compare them with a "without project" scenario. The analysis shall apply the mitigation hierarchy (avoidance, minimisation, mitigation and offsetting or compensation) and compare the alternatives in terms of environmental and social impacts, stakeholder acceptability, land use and tenure, capital and operating

costs, suitability under local conditions, and institutional, training and monitoring requirements, quantifying costs and benefits where possible. Where the Feasibility Stage recommendation differs from the environmentally and socially preferred option, the Consultant shall state the difference and its consequences.

- **Climate risk:** The Consultant shall state the weather and climate parameters assessed and the temporal and spatial scale of the modelling, field-check climate-sensitive areas within and outside the project boundary, identify the vulnerability of the lines and substations, and prioritise the adaptation and resilience measures to be reflected in the design, the technical specifications and the maintenance and operation guidelines. These measures shall be transmitted to the engineering team and recorded in the interface register (Annex I, Section 3.11).
- **Disadvantaged and vulnerable groups, and indigenous peoples where present:** The baseline shall characterise their demography, livelihoods, use of natural resources, institutions and relations with other groups, with gender-specific information. Contacts and interviews shall be planned and carried out in a culturally appropriate manner, in languages used by the communities and on the basis of free, prior and informed consent. The Consultant shall identify other disadvantaged groups (for example minority clans and displaced persons), assess the project's impacts on them and recommend measures of special assistance.
- **Baseline data record:** Each baseline dataset shall record the date, method, location, limitations and seasonal conditions of the survey, as required by Section 3.5 of the General Terms of Reference, and shall be geo-referenced.

3.3 Impact assessment

Direct, indirect, induced and cumulative impacts shall be assessed for the construction and operation of each line and substation, in the short and long term, using one significance-rating method with defined criteria applied consistently to all line routes. The assessment shall give particular attention to:

a. loss or degradation of forests and of natural and critical habitats, including bird and animal movement routes and biodiversity hotspots;
b. water quality and the disposal of solid, liquid and hazardous waste from camps and construction;
c. public health and community safety, including electromagnetic field exposure, disease transmission and security risks in remote areas or areas with a history of conflict;
d. labour influx and its related risks, including sexual exploitation and abuse and sexual harassment (SEA/SH), transactional sex and conflict between workers and communities, with reference to good-practice guidance on labour influx and gender-based violence;
e. risks to workers, including occupational health and safety, discrimination, child and forced labour, unequal terms of employment and the influence of clan considerations on local employment;
f. gender-differentiated impacts, and impacts that may fall disproportionately on disadvantaged and vulnerable groups, including exclusion from project benefits, with differentiated measures proposed where such groups are identified;
g. permanent and temporary land acquisition, restrictions on land use and loss of access to natural resources, assessed in coordination with the RAP (Annex III);
h. physical cultural resources and archaeological, historical and cultural heritage; and
i. induced impacts of auxiliary and associated facilities, substations, lines and access roads, including pressure on natural resources, waste management, strain on local services and community safety, as well as beneficial effects such as improved economic connectivity.

The Consultant shall also take into account the relevant AfDB directives, guidance notes and guidelines, including the Directive on addressing impacts on disadvantaged and vulnerable groups and individuals, the Guidance Note on gender-based violence and the EHS Guidelines.

3.4 Stakeholder engagement and consultation record

- Identify, analyse and map the project-affected parties and other interested parties, and specifically identify those who may be disadvantaged or vulnerable. In consultation with them, recommend practical measures that enable their meaningful participation and their access to project opportunities (for example employment) and benefits.
- Disclose project information as early as possible, in local languages and in an accessible and culturally appropriate form, in time for stakeholders to understand the risks, impacts and opportunities and to take part in consultation on the project design.
- Update the draft SEP (ES1) in consultation with the identified stakeholders, so that it applies throughout the project cycle. Engagement shall be used to take account of stakeholders' interests and to improve the project plan and design, and shall not be limited to information sessions.
- Document every consultation: date, venue, participants (disaggregated by sex and by group, including vulnerable groups), issues raised, the response given and how the ESIA, the ESMP or the design was changed as a result. Include women-only consultations.

3.5 Additional content of the ESMP

In addition to the content required by Section 3.5 of the General Terms of Reference, each ESMP shall contain:

a. **Institutional arrangements:** an organogram showing all parties involved in ESMP implementation, monitoring, reporting, independent supervision and auditing (the Client, the PIU, contractors, the supervision consultant and the regulatory authorities), their relationship to the project construction and operation teams, and their responsibilities.
b. **Costs, staffing and training:** a costed budget for each measure, in a form that can be transferred to the bills of quantities (Annex I, Section 4.5), with the work programme, staffing, training and support services needed, and the arrangements for compensation for impacts that cannot be mitigated, coordinated with the RAP.
c. **Monitoring plan:** for each management plan, the parameters, locations, frequencies, methods, budget and responsible entities, with procedures for identifying root causes, correcting non-compliance (including remedial measures) and adjusting management measures.
d. **Independent auditing and compliance:** proposed independent auditing arrangements and incentive schemes or penalties to enhance contractor compliance.
e. **Grievance redress mechanism (GRM):** a project GRM for complaints arising during construction and operation, together with the requirement for each contractor to maintain its own GRM for complaints from communities and from contractor workers. The GRM shall make use of local and socio-cultural redress systems so that grievances are resolved at the lowest possible level, shall include legal and other redress channels, including the AfDB's Grievance Redress Service, and shall provide a confidential channel for SEA/SH complaints.
f. **Contractor-ready management plans:** the plans listed in Section 3.5 of the General Terms of Reference, including a compensatory planting plan consistent with Government of Sierra Leone requirements and with conservation offsets where required, prepared to the level supported by the design, together with the corresponding bidding requirements and the list of contractor plans required before mobilisation.

3.6 Social management instruments

The instruments covering land acquisition and involuntary resettlement are delivered through the RAP (Annex III). Where the scoping identifies the presence of indigenous peoples or a need for benefit-sharing arrangements, the Consultant shall prepare the corresponding instrument, in coordination with the ESIA and the Feasibility Stage findings and recommendations.

4. FORMAT AND QUALITY REQUIREMENTS

a. **Consistency:** the project description, land requirements, costs and schedule in the ESIA and ESMP shall be consistent with the design (Annex I) and the RAP (Annex III), using the common project database and the interface register (Annex I, Section 3.11). Material design changes during the Design Stage shall be screened against the ESIA and the ESMP shall be updated accordingly.
b. **Format:** reports in English, as a separate volume for each line route, in editable electronic form and PDF. Maps and spatial data shall be geo-referenced and submitted in GIS format, photographs shall be geo-tagged, and raw field data and laboratory results (analysed by accredited laboratories) shall be submitted with the reports.
c. **Review:** each version shall address the consolidated comments received on the previous one, with a comments-response table, and the final versions shall be in a form suitable for disclosure.

ANNEX III
RESETTLEMENT ACTION PLAN (RAP): SPECIFICATION OF DELIVERABLES

1. PURPOSE AND RELATIONSHIP TO THE GENERAL TERMS OF REFERENCE

1.1 Purpose

This Annex specifies the detailed content, format and quality requirements of the Resettlement Action Plan (RAP) deliverables. The objective and scope of the RAP, the applicable legal and policy framework, and the approach to the census, consultation and livelihood restoration are set out in Section 3.6 of the General Terms of Reference and are not repeated here. This Annex shall be read together with the General Terms of Reference and, in the event of any inconsistency, the General Terms of Reference shall prevail.

1.2 Application

A separate RAP shall be prepared and submitted for each line route listed in Section 2.3 of the General Terms of Reference, covering the lines, the substations listed in Section 2.5 and any ancillary and associated facilities, so that each route can be cleared and disclosed independently of the others. The content and level of detail of each RAP shall be proportionate to the nature and scale of the involuntary resettlement anticipated on that route. The deliverables are submitted with the D1 to D4 reports of Table 2 of the General Terms of Reference, as shown in Section 2 below, and are coordinated with the design work (Annex I) and with the ESIA and ESMP (Annex II). The census shall be carried out in collaboration with the PIU and the Ministry of Energy. The qualifications and inputs of the Consultant's staff, the delivery timelines, the payment milestones, the reporting lines and the facilities provided by the Client are governed by the General Terms of Reference.

2. RAP DELIVERABLES

For each line route the Consultant shall submit the following deliverables with the report indicated. The detailed content of each is specified in Section 3.

Ref.	Deliverable (per line route)	Principal content	Submitted with
RP1	RAP Work Plan and Census Methodology	Census and survey methodology, questionnaires and tools; enumerator recruitment and training plan; local decision-making bodies to be established; proposed cut-off date and how it will be communicated; categories of project-affected persons (PAPs); programme of field work by route	D1 Inception Report
RP2	Land-take and Resettlement Impact Screening Report	For each alignment and site option, estimate of the land and assets affected by the corridor, tower and pole footprints, substation sites and access roads, and of the affected communities and livelihoods, so that resettlement impacts inform the choice of options (avoid or minimise); components that give rise to resettlement	D2 Interim Report
RP3	Census, Asset Inventory and Socio-	Results of the census and asset inventory, the vulnerability register and the PAP database, as specified in Section 3.1	D3 Draft Report

	economic Baseline Report		
RP4	Draft RAP	Complete RAP containing the chapters in Section 3.2, based on the design (Annex I) and the data in RP3, including the first round of consultation and the draft entitlement matrix and budget	D3 Draft Report
RP5	Final RAP	Final RAP incorporating the second round of consultation (validation of the data and acceptability) and the comments of the PIU and AfDB, with a comments-response table; final PAP database; summary of entitlements and of the grievance procedure in the languages understood by PAPs; package for disclosure	D4 Final Report

3. SPECIFIC CONTENT REQUIREMENTS

3.1 Census, asset inventory and socio-economic baseline

The Consultant shall use the data collected in the Feasibility Stage and under the ESIA and avoid duplicate data collection; field work shall be limited to filling gaps. The census and baseline shall contain:

a. **Census of households and individuals:** the number of people affected and their characteristics (age, sex, education, occupation, health status), sources of livelihood and income from formal and informal activities, production systems, household organisation and standard of living, with data disaggregated by sex.
b. **Cut-off date:** the date, the criteria for eligibility and the evidence of its public and written communication, together with a provision for updating information on livelihoods and standard of living at regular intervals until displacement.
c. **Asset inventory:** marking of the corridor of impact and of the affected portion of each property; enumeration of the affected structures, land (with the type of tenure, including customary tenure), crops and trees, graves and cultural assets, and public or community infrastructure and services; each geo-referenced and photographed; and an assessment of the magnitude of the loss (total or partial) and of the physical or economic displacement.
d. **Vulnerability register:** the persons and groups for whom special provisions are needed (for example indigenous peoples, ethnic minorities, the landless, the elderly, persons with disabilities and women-headed households), with the provisions proposed.
e. **Socio-economic context:** social and cultural characteristics of the affected communities, their social networks and support systems, and the formal and informal institutions relevant to consultation and to the design and implementation of resettlement; where relocation is needed, the boundaries of the relocation area and an assessment of the host communities, including their services and facilities.
f. **PAP database:** an editable database (Excel or equivalent) with a unique identifier for each household and PAP, linked to the asset inventory, photographs, entitlements and compensation status, for use in implementation and monitoring.

3.2 Chapters of the RAP

Each RAP shall follow the outline for resettlement plans in the AfDB's Integrated Safeguards System and shall contain at least the following chapters:

1. **Project description and impacts:** the components or activities that give rise to resettlement or restriction of access, the zone of impact, the alternatives considered to avoid or minimise resettlement, and the mechanisms to minimise displacement during implementation.
2. **Census and baseline:** the findings specified in Section 3.1.
3. **Legal and institutional framework:** the laws on land acquisition, tenure (including customary tenure), valuation, compensation and the agencies responsible, the judicial remedies available to displaced persons, a gap analysis against the AfDB requirements, and the measures to bridge the gaps, including any legal steps needed to recognise claims to land and to regularise tenure or transfer titles to resettlers.
4. **Eligibility and entitlement matrix:** the criteria for eligibility, including for persons without formal title, and the entitlements by category of PAP and type of loss.
5. **Valuation and compensation:** the methodology for valuing losses at replacement cost, including the survey of market rates and their adjustment for inflation, the types and levels of compensation under national law, the supplementary measures needed to reach replacement cost, and the procedure for payment and for verification of PAPs.
6. **Resettlement and livelihood measures:** compensation and other measures in lieu of demolition of structures and disruption of livelihoods; a Livelihood Restoration Plan (or Livelihood Enhancement Plan) based on the livelihood assessment; where relocation is needed, the preparation of relocation sites of at least comparable productive potential and location, with timetables for land acquisition and transfer; transitional and special assistance to vulnerable groups; and measures to prevent land speculation and the influx of ineligible persons.
7. **Consultation and participation:** the strategy for consultation with PAPs and host communities, including the negotiation of compensation, a summary of the views expressed and how they were taken into account, and measures to ensure that vulnerable groups are adequately represented. At least two rounds of public consultation shall be held, the first to collect information on the proposed activities and the second on the draft RAP, to validate the data and to confirm acceptability. Women-only sessions shall be included, and attendance shall be recorded by sex.
8. **Grievance redress mechanism:** an accessible mechanism for RAP-related and GBV-related complaints, taking account of gender, vulnerable groups and illiterate PAPs, that uses the Client's internal structures and existing community and traditional systems and preserves access to judicial recourse; with guidelines for recording complaints and responding within defined times, and linked to the project GRM in the ESMP (Annex II, Section 3.5).
9. **Institutional arrangements and capacity:** the responsibilities of the agencies and officials involved, covering delivery of compensation and services and coordination between agencies and jurisdictions; the capacity-building measures needed; and the transfer of responsibilities to local authorities or PAPs where appropriate.
10. **Implementation schedule:** all RAP activities from preparation to monitoring and evaluation, with target dates for the delivery of compensation and other benefits, linked to the construction schedule and allowing for the rainy season and other external factors, so that compensation is delivered before the affected land is taken, and with a defined closing date.
11. **Costs and budget:** itemised cost estimates for all RAP activities, adjusted for inflation, population growth and contingencies, with the timetable of expenditure, the source of funds, the arrangements for the timely flow of funds and the fiduciary arrangements consistent with Sierra Leone's financial management and AfDB requirements.

12. **Monitoring and evaluation:** performance indicators for inputs, outputs and outcomes; internal monitoring by the implementing agency, supplemented by independent monitoring; participation of PAPs in monitoring; the frequency and content of reporting and how the results feed back into implementation; and a completion audit and evaluation of the impact of resettlement after all resettlement and related development activities have been completed.

The RAP annexes shall include the entitlement matrix, the census forms, the list of persons consulted with the minutes of consultations, the maps and the photographs.

3.3 Social impact evaluation, including gender and GBV impacts

The RAP shall include an evaluation of the social impacts of the resettlement on each line route, based on field investigations, surveys and interviews with selected stakeholders, using gender-disaggregated data and addressing gender-differentiated impacts and the risk of gender-based violence. The evaluation shall determine whether the impacts are likely to be significant and shall identify and, where possible, quantify the compensation and mitigation measures, in accordance with international good practice. It shall be consistent with the social baseline and the impact assessment of the ESIA (Annex II).

4. FORMAT AND QUALITY REQUIREMENTS

a. **Compliance:** each RAP shall comply with the AfDB Integrated Safeguards System and the applicable laws of Sierra Leone, and shall be prepared in a form suitable for disclosure in-country and by the AfDB.
b. **Consistency:** the land requirements, impacts, costs and schedule in the RAP shall be consistent with the design (Annex I) and the ESIA and ESMP (Annex II), using the common project database and the interface register (Annex I, Section 3.11). Changes in land requirements arising from the detailed design shall be reflected in an updated RAP.
c. **Format:** a separate RAP report for each line route, in English, in editable electronic form and PDF. The PAP database shall be submitted in editable form, spatial data of the affected parcels and structures in GIS format, photographs geo-tagged, and raw census data with the reports.
d. **Review:** each version shall address the consolidated comments received on the previous one, with a comments-response table.

ANNEX IV

GENDER GAP ANALYSIS: SPECIFICATION OF DELIVERABLES

1. PURPOSE AND RELATIONSHIP TO THE GENERAL TERMS OF REFERENCE

1.1 Purpose

This Annex specifies the detailed content, format and quality requirements of the Gender Gap Analysis Study deliverables. The objectives and scope of the Gender Gap Analysis, the applicable gender equality and policy framework, and the approach to gender assessment, data collection, stakeholder consultation and development of gender-responsive recommendations are set out in Section 3.7 of the General Terms of Reference and are not repeated here. This Annex shall be read together with the General Terms of Reference, and, in the event of any inconsistency, the General Terms of Reference shall prevail.

1.2 Application

A separate Gender GAP Analysis shall be prepared and submitted for each line route listed in Section 2.3 of the General Terms of Reference, covering the lines, the substations listed in Section 2.5 and any ancillary and associated facilities, so that each route can be cleared and disclosed independently of the others. The content and level of detail of each gender analysis shall be proportionate to the nature and scale of the different needs, roles, constraints and opportunities of women, men, girls, boys and vulnerable groups anticipated on that route. The deliverables are submitted with the D1 to D4 reports of Table 2 of the General Terms of Reference, as shown in Section 2 below, and are coordinated with the design work (Annex I) and with the ESIA and ESMP (Annex II). The census shall be carried out in collaboration with the PIU and the Ministry of Energy. The qualifications and inputs of the Consultant's staff, the delivery timelines, the payment milestones, the reporting lines and the facilities provided by the Client are governed by the General Terms of Reference.

2. GENDER GAP ANALYSIS STUDY DELIVERABLES

For each line route, the Consultant shall submit the following deliverables with the report indicated. The detailed content of each is specified in Section 3.

Ref.	Deliverable (per line route)	Principal content	Submitted with
GA1	Gender Work Plan and Census Methodology	Detailed methodology and work plan; gender assessment framework; data collection tools and questionnaires; stakeholder mapping; identification of relevant gender-disaggregated indicators; proposed consultation methods, including separate consultations with women and other vulnerable groups where appropriate; fieldwork programme covering the project areas and target communities.	D1 Inception Report
GA2	Gender Baseline and Stakeholder Assessment Report	Review of existing gender-related data and policies; socio-economic and demographic gender baseline; assessment of gender roles, responsibilities and decision-making structures; analysis of existing	D2 Interim Report

		disparities in access to electricity, productive resources, employment, education, economic opportunities and community participation; identification and mapping of key stakeholders and barriers affecting women's participation and benefits.	
GA3	Draft Gender Gap Analysis Report	Results of the gender gap analysis and costed Gender Action Plan; draft stakeholder consultation and field assessment reports; draft Capacity development programme; as specified in Section 3.1	D3 Draft Report
GA4	Final Gender Gap Analysis Report and Gender Action Plan.	Final Gender Gap Analysis incorporating stakeholder consultation findings and comments from the PIU and AfDB; comprehensive Gender Action Plan with practical interventions, measurable targets, indicators, responsible institutions, implementation timelines and indicative budget; recommendations for gender-responsive project implementation, monitoring and reporting; final consultation report; comments-response matrix; and an executive summary suitable for project dissemination.	D4 Final Report

3.0 TASKS UNDER THE GENDER GAP STUDIES

1: Assess the Current Status of Gender Relations within the SLREAP Project Communities.

- Analyze the Social Structures: Examine the existing social structures and cultural norms that influence gender roles within SLREAP project communities. This includes identifying how traditional practices impact women's and men's access to energy resources.
- Evaluate Energy Access: Investigate the current access to energy resources for different genders, determining who benefits more from energy supply and how.
- Participation in Energy Decision-Making: Assess the involvement of men and women in energy-related decision-making processes at household and community levels, and identify any disparities in representation.

2. Identify Key Barriers to Gender Equality and Women's Empowerment:

- Access to Education and Training: Identify barriers preventing women from acquiring education, training, and skills related to energy management, technology use, and sustainable practices.
- Economic Constraints: Explore economic factors such as poverty and lack of financial resources that hinder women's ability to participate in energy projects.
- Cultural and Social Barriers: Document cultural and societal attitudes that might discourage or prohibit women from engaging in energy-related activities, including leadership roles in community energy initiatives.

3. Analyze the Impact of Existing Policies and Programs on Gender Equity:

- Policy Review: Conduct a thorough review of local, regional, and national energy policies, evaluating their implications for gender equality. Identify any gender-specific provisions or gaps in existing policies that influence access and decision-making.

- Program Effectiveness: Assess the effectiveness of current energy programs and projects in promoting gender equity, examining participation rates and outcomes for women versus men.
- Data Collection Disparities: Analyze the availability and disaggregation of data by gender in energy initiatives and identify ways to improve data collection for better policy-making.

4. Provide Actionable Recommendations to Address Gender Disparities:

- Develop Gender-Sensitive Policies: Propose modifications to existing policies and suggest new strategies that promote equitable access to energy resources for all genders. This could include incentives for women-led small enterprises in energy production or distribution.
- Capacity Building Initiatives: Recommend training programs aimed at empowering women with the technical and business skills necessary for engagement in the energy sector, thereby enhancing their economic independence.
- Engagement Strategies: Suggest community engagement strategies that ensure women's voices are included in planning and implementation processes for energy projects, fostering an inclusive environment conducive to gender equity.
- Monitoring and Evaluation Framework: Create a framework for ongoing monitoring and evaluation of gender equity within the SLREAP rural electrification project, ensuring that progress is tracked and adjustments are made as necessary.

4. FORMAT AND QUALITY REQUIREMENTS

a. Compliance: The GAP Analysis shall comply with the AfDB Integrated Safeguards System and the applicable laws of Sierra Leone, and shall be prepared in a form suitable for disclosure in-country and by the AfDB.

b. Consistency: The gender baseline, identified gaps, potential impacts, recommendations, proposed interventions and implementation costs shall be consistent with the project design (Annex I), the ESIA and ESMP (Annex II), and the RAP (Annex III), as applicable, using the common project database and relevant project coordination arrangements. Any changes in project design, target communities or implementation arrangements that may affect the gender assessment shall be reflected in an updated analysis and Gender Action Plan.

c. Format: a separate GAP report for each line route, in English, in editable electronic form and PDF. The gender action plan (GAP) database shall be submitted in editable form, structured format showing proposed activities, measurable indicators, targets, responsible institutions, implementation timelines and indicative budgets.

d. Review: each version of the gender gap analysis and the gender action plan shall address the consolidated comments received on the previous one, with a comments-response table.

**********END**********

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Electricity Distribution and Supply Authority

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