Federal Government of Somalia
Ministry of Energy and Water Resource

REQUEST FOR EXPRESSIONS OF INTEREST (REOI) – EXTENSION OF SUBMISSION DEADLINE

COUNTRY: **Federal Government of Somalia (FGS)**
NAME OF PROJECT: **Somali Electricity Access Project (SEAP)**
PROJECT ID: **P165497** **Grant No.: TF-A9159-SO**
ASSIGNMENT TITLE: **Preparation of Electricity Sub-Transmission and Distribution Integrated Development Least Cost Investment Plans**

REFERENCE NO.: **SO-MOEWR-263894-CS-CQS**
PLACE OF ASSIGNMENT: **Somalia**

The Federal Government of Somalia (the Government) is currently implementing Somali Electricity Project (SEAP), with grant funding from World Bank. The project development objective of SEAP is to expand access to electricity in targeted urban, peri-urban, and rural communities. SEAP consists of three components:

Component 1: Electrification of households and small businesses through standalone solar home systems: This component aims to reduce market barriers for the private sector to provide modern energy access through solar home systems and targets (i) poorer households and small businesses in areas that cannot afford to connect to mini-grid services; (ii) households and businesses in these areas that are not sufficiently close to a mini-grid to be economically connected; (iii) isolated villages and smaller settlements where mini-grids do not make economic sense; and (iv) nomadic pastoralists whose livelihoods do not lend themselves to a fixed electricity connection. This component will fund a range of market-building supply-and demand-side interventions in response to these challenges. The proposed intervention includes: Seed and result based grants, consumer awareness and quality assurance.

Component 2: Analytic work for enabling electrification through Solar Powered / Hybrid Mini-grids: This component will support the mini-grid sector in Somalia. this component is expected to include the following activities: (i) Detailed geospatial mapping, (ii) Review of property rights and land issues pertaining to energy infrastructure investment, (iii) Pre-feasibility studies for hybridization, (iv) Pre-feasibility studies for greenfield (new) sites identified in geospatial mapping, (v) Developing structuring options for the financing, operation, and ownership of new mini-grids; and (vi) Defining legal, institutional and financing arrangements for developing mini-grids.

Component 3: Technical Assistance, Capacity Building and Project Management: This component will support a range of activities to strengthen the capacity of the Ministry and overall energy sector management, power and access planning, and provides support for project management/implementation, including staffing of the PIU.

The FGS now seeks to competitively select a firm or consortium of firms (the "consultant") on behalf of the Ministry of Energy and Water Resources, with demonstrative expertise and experience to undertake Preparation of Electricity Sub-Transmission and Distribution Integrated Development Least Cost Investment Plans.

The Consultant will undertake all the specific tasks detailed out in the Terms of Reference (TOR) and expected to be carried out in **six (6) months** from commencement. The detailed Terms of Reference (TOR) for the assignment can be found at the following website: www.moewr.gov.so or it can be provided upon submission of application in person or by e-mail. The e-mail address is provided below.

The Ministry of Energy and Water Resources now invites eligible firms ("Consultant") to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services (brochures, description of similar assignments, experience in similar conditions, availability of appropriate skills among staff, etc.). The short listing criteria are as follows:

a) Core business of the firm and years in business.
b) Specific experience of conducting similar assignments on the electricity sector, especially in power distribution system planning and operations; and familiarity with World Bank policies and procedures;
c) Experience of relevant services in an environment similar to that of Somalia; and
d) The technical and managerial organization of the firm. (Provide only the structure of the organization, general qualifications and number of key staff. Do not provide CV of staff). Key experts will not be evaluated at the shortlisting stage.

The attention of interested Consultants is drawn to paragraphs 3.14, 3.16 and 3.17 of the World Bank's *Procurement Regulations for IPF Borrowers: Procurement in Investment Financing - Goods, Works, Non-Consulting and Consulting Services* dated July 2016 and revised in November 2017 and August 2018 and November 2020, ("Procurement Regulations"), setting forth the World Bank's policy on conflict of interest.

Consultants may associate with other firms to enhance their qualification but should indicate clearly whether the association is in the form of a joint venture and/or a sub consultancy. In case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

A Consultant will be selected in accordance with the **Consultant Qualification Based Selection (CQS)** method set out in the World Bank's Procurement Regulations.

Interested Consultant may obtain further information at the address below during office hours from **8:30 to 16.00 hours** Mogadishu time (Excluding public holidays).

Expressions of interest (EOI) should be delivered (in person or by e-mail) in a written form in three (3) hard copies (if not by e-mail) to the address below. The deadline for submission of EOI has been extended to not later than **Tuesday 18th January 2022 at 16:00 Hours (Mogadishu Time)**. Consulting firms that have already submitted their expression of interest are not required to resubmit.

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ANNEX: TERMS OF REFERENCE

Consultancy Services for the Preparation of Electricity Sub-Transmission and Distribution Integrated Development Least Cost Investment Plans

1. **Sector Background**. Currently, there is no integrated national grid in Somalia. The system of delivering the electricity services comprises of a network of isolated distribution grids with isolated generation owned and operated by private Energy Service Providers (ESPs). The main source of generation is high-speed diesel generation sets with a few hybrid systems that include Solar PV and wind power turbines. Each ESP owns and operates their standalone generation-distribution-customer-revenue chain using mainly radial distribution island networks. Consequently, there is significant duplication of generation, distribution, technical, maintenance and human capability infrastructure. Duplication is especially acute for ESPs within the cities having multiple ESPs and has resulted in some consumers opting for: (i) utilizing two different ESPs, in effect multiple networks supplying one customer; or (ii) creating their own on-site, captive generation stand-alone "mini-grids". The key consequence is that most generators are not efficiently utilized and operating well below their expected and designed performance criteria which operation results in significant amounts of "wet stacking" (diesel fuel waste, extra pollution, performance degradation and shorter lifespans). Further, most ESPs distribute electricity to their customers via low voltage (LV) feeders, which not only limits the system capacity but is one of the major causes of the high technical losses. There is thus urgent need to implement synchronization between the generating units and upgrade of the distribution network to both increase the network capacity and reduce losses.

2. **Objectives of the Study**. The main objective of the study is to support the preparation of Integrated Distribution Network System Plan for the key load centers of Bosaso , Baledwayne, Baidoa, Kismayo and Sama-reeb. This is aimed at addressing all aspects of distribution system planning regarding the long-term or strategic planning given the urgent need for the distribution network reconstruction, reinforcement and expansion premised on sound utility planning procedures and standardized designs and an unprecedented investment program in distribution networks.

3. A further objective of the study is to formulate a blueprint for the Distribution Electricity Networks Development Plans for the next 10 years which shall be practical and comprehensive. The Plans shall coordinate generation, transmission, and distribution expansion to ensure that all proposed capital investments are not ad hoc and are instead part of a long-term structured plan. It will ensure that distribution network reconstruction, reinforcement and expansion is economically efficient and will provide a realistic framework for integrated network operations, generation optimization, improved electricity supply reliability and loss reduction. The study shall use the least cost analysis to compare various options available for development of the distribution systems. In addition, the objective of the study is to conduct technical transfer and capacity building through the development of network standards and guidelines, network modelling, on-the-job trainings, seminars and technical workshops for key stakeholder personnel in modern planning techniques and tools.

4. **Key expected Outputs**
   - (i) A review of the demand forecast for each of the load centers.
   - (ii) A series of least cost distribution expansion plans matched to expected demand growth as well as generation and transmission expansion plans.
   - (iii) A Distribution Investment Plan to meet demand growth inclusive of the reconstruction and reinforcement requirement.

(iv) A program of distribution loss reduction initiatives; with an assessment of returns expected from investments in terms of technical and non-technical (commercial) loss reduction.

(v) An assessment of the amount and timing of distribution investments for each system development scenario.

(vi) Institutional, legal, and regulatory recommendations to support the implementation of the investment plan.

5. **Scope of Services.** The above outputs shall be achieved by using the least cost analysis to compare various options for generation, transmission, and distribution through the following key activities to include:

(i) Data collection, validation, and analysis for each load center.

(ii) Prepare standards for use as well as guidelines for the development of the sub-transmission and distribution network including user manuals.

(iii) Assessing existing electricity demand and a demand forecast using appropriate forecasting methods.

(iv) Assessing planned generation development, new generation sites, hybrid renewable generation, interconnections and compare the likely development costs.

(v) Analysis of the least cost staged generation expansion plans.

(vi) Undertaking computer modeling analysis of sub-transmission and distribution (including MV and LV networks) systems and analyze constrains.

(vii) Developing and conducting computer modeling (modern software) of the distribution network expansion options to match the Existing/various generation expansion plans and forecasting demand growth.

(viii) Estimate annual investment requirements and investment net present values under each site expansion plans and for reasonable set of input cost assumptions.

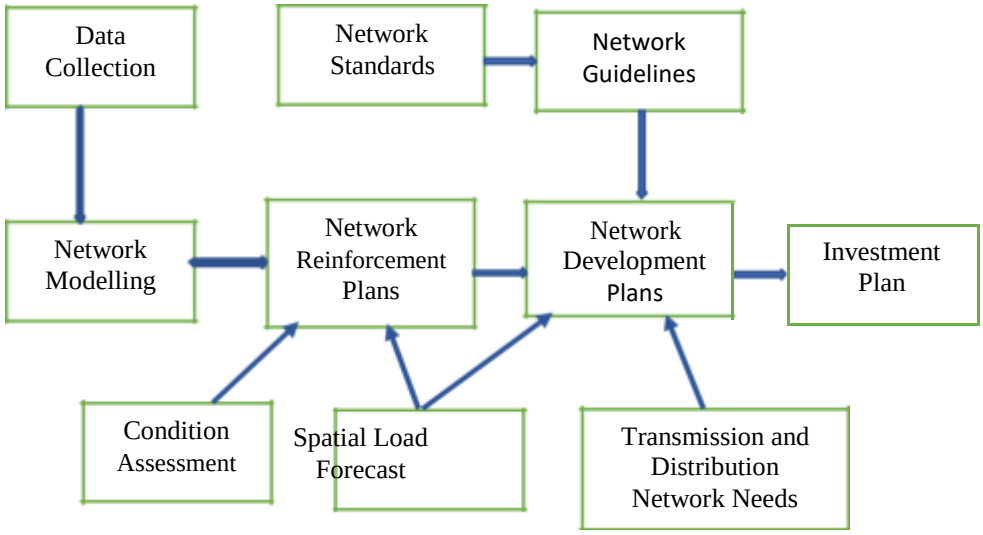
(ix) Identify, analyze, and prepare cost estimates for options and opportunities for network reconstruction, reinforcement and expansion including loss reduction, including projects forming part of the overall master plans and stand-alone projects.

(x) Prepare a detailed and ranked/prioritized distribution capital projects plan (for each of the load centers) for the first 5 years of the master plans, including loss reduction subprojects

(xi)

6. **Methodology.** The consultant will review the City Plans prepared under the Somalia Power Sector Masterplan, Least Cost Geospatial Electrification Plan to Achieve Universal Electricity Access in Somalia and undertake additional activities to meet the requirements of these ToRs. The Integrated Distribution Network System Plans main focus shall include a capacity development program so as to begin equipping the various stakeholders with the tools and knowledge required to be able to conduct the planning that is necessary. The general methodology for the assignment shall include, but not be limited, to the activities/ steps highlighted below

Figure 1. General Methodology



7. **Data Collection**. The Consultant will collect data and conditional assessment of the existing network deemed necessary by the Consultant to undertake the assignment. The results obtained by the Consultant must reflect existing operating conditions of the network. The consultant will undertake a review and update the demand forecasts for each load center. The analysis will include time series data to enable the calculation of network performance, including losses. The Consultant will also have to develop working relationships with the various stakeholders including the government agencies and the ESPs to establish data quality alignment and develop a mechanism to enable comparison of baseline system modelling to enable the confirmation of the network system quality of modelling.

8. **Network modelling.** Based on the data collected, the Consultant shall Develop the network connectivity models based on the information/data collection. The network connectivity models built by the Consultant will need to be tested using parameters and readings (voltage and current of feeders and transformers loading). Before proceeding with the preparation of the different scenarios, the Consultant must agree with the various stakeholders as to the suitability of the network model to conduct long-term planning. Once data are validated and captured in the system model built by the Consultant, the Consultant shall prepare a base-case scenario reflecting existing system parameters, and operating conditions, and including, but not limited to the generation, transmission, and the distribution network systems. Although the modelling of the power network will be established for the transmission system, this will not include studies for the transmission network (>132KV), which is beyond the scope of the proposed assignment. The system, however, will be used to calculate fault level in-feeds and power flows into the distribution network and Bulk Supply Points (BSPs). The model shall also include the primary and secondary distribution network. The secondary network shall include the main lines that can enable the optimum operation of the network especially generation synchronization. The model shall also include the LV network in order to obtain the picture of the voltage profiles.

9. **Load flows and loss calculations.** The Consultant shall conduct load flow studies of the distribution network, based on the demand forecast and identify the distribution system reinforcement and expansion plans to meet the forecasted demand and reduce overall network technical losses. These load flows shall include the maximum and minimum loads. The analysis shall also include the load time series to establish distribution system and compare them with the actual figures and the results from the data measurements. The load profiles shall be analyzed with consideration of system operation and in preparation for the system distribution planning. This should establish the performance of the current system and its limitations and constraints.

10. **Network System Design**. The consultant shall review existing designs and prepare standards and guidelines for optimized network designs and standards for major load centers of Bosaso , Baledwayne, Baidoa, Kismayo and Sama-reeb , As an output, the consultant shall prepare a detailed distribution network design manual. The design considerations shall include but not be limited to the following:

***Network Planning Standards and Guidelines*.** The consultant shall develop planning standards based on the desired requirements/criteria for the distribution system and the quality level as part of the capacity development program. These shall set standards which the network must meet that balance reliability, cost, and quality. The consultant shall prepare planning guidelines documents to help guide network development by the network planners against these standards.

Smart grid considerations will be an integral part of the distribution planning. This will include consideration of, but not limited to: (i) Advanced Distribution Management System; (ii) Remotely controlled sectionalizes and auto-re-closers; (iii) Smart metering; and (iv) Integration of renewables in the distribution system including net metering at consumer premises.

Voltage upgrade considerations. The current network system is based predominantly on 11kV and 33KVdistributors with 15KV and 22KV in some areas. The consultant shall review the option to upgrade the distribution network standard medium voltage especially as the loads grow in addition to the potential wayleave space constraints especially in urban areas. In view of the major investment to reconstruct and reinforce the distribution network, it is important that sector stakeholders appreciate the benefits of a potential voltage upgrade and the complexities and phasing of such an exercise including conversion of the entire system to underground in some selected areas such as urban centers. The considerations will include approaches such as: (i) Use the model for the existing system to consider voltage upgrades; (ii) Draw from experiences in other countries who have changed / rationalized their distribution networks; (iii) Provide substantiated pros and cons of maintaining the current voltage levels system versus changing; (iv) Present the challenges in adopting a voltage rationalization to, for example, 33KV distribution; (v) Consider options, such as starting with large cities and using existing equipment for outlying areas; (vi) Set out the steps / timing of possible scenarios, e.g. using dual voltage transformers, gradual rehabilitation of distribution network to a high voltage level, cable replacing/upgrading policies.

Conductor optimization shall be undertaken to consider the size and type of conductors that should be used in the reconstruction and expansion for both the overhead and underground distribution network.

MV and LV network design. The Consultant will review the current practices of MV distribution line design and shall provide recommendations for an improved design with lower costs and equal or better performance, footprint, etc. The Consultant shall also study the existing design of the LV network and offer recommendations for an improved layout and configuration.

Distribution Transformer optimization. As part of the review of system design, the Consultant shall consider the current practice of distribution transformers with regards to a) the support structures and transformer configuration to reduce costs; and b) types of distribution transformers, their efficiency and other characteristics used.

Fault level calculations. Fault level analysis will be carried out to determine design parameters and equipment specifications. Fault level analysis shall be carried out for both single and three phase faults. The analysis will consider the distribution system with the entire primary substations included. This will be used to check the ratings of the switchgear employed and future requirements. In addition, the consultant shall conduct a protection setting calculations and recommend a protection coordination system including relay settings against the fault levels that will be calculated.

Maintenance management practices. The Consultant shall review maintenance management process and provide recommendations to have prudent utility procedures established.

Advanced Distribution Management System (ADMS). The Consultant shall consider the mode of the distribution system control, communication, management of control, safety, etc. The Consultant shall also consider establishment of distribution mini control centers including switching devises. As part of the proposal, the consultant shall advise, based on his experience, recommendations on Integrated Advanced Distribution Management Systems Software to be procured as part of the consultant's services. The consultant will be required to Use an internationally recognized sub-transmission and distribution planning software (ADMS)**.** The software shall, among others, at least include features related to Integrated Distribution Managements System (IDMS) including a Geographical Information System (GIS) based network modelling, planning and real-time network operations and monitoring. Further the system shall include features related to Commercial Management Systems (CMS), Energy Management System (EMS) and Enterprise Resource Planning (ERP).

11. **System development**. Once the Consultant has undertaken the system modelling and completed the design considerations, the Consultant will then proceed with considering the development plans for the future system reflecting the projected demand. Loading shall be apportioned according to the demand forecast. The system development shall consider system topology and reconfiguration flexibility as well as use of smart switches to provide improved flexibility and reliability in addition to multi-generation synchronization. The system development shall be aimed at creating an integrated grid in the short-medium term, and the longer-term outlook for the primary distribution network and BSPSs to the distribution network. The system requirements for the next 5 and 10 years shall be prioritized/ranked and included within the proposed investment plan.

12. **Economic and Financial analysis**. As part of the study, the Consultant will undertake a cost benefit analysis of the proposed development options to determine the prioritized and ranked network development plan. A detailed economic and financial analysis will be conducted for the proposed options.

13. **Short-Medium Term Investment Plan.** Based on the results of the network modeling, the consultant shall prepare a short-medium term (2021-2030) network reinforcement and expansion plan for each of the load centers. This plan shall be based on detailed network analysis and identify proposed 132 kV and 33/11 kV (medium voltage ((MV) and associated Low Voltage (LV) investments required. The key objective would be to identify the required investments to facilitate uptake of new generation; assist in synchronizing the existing generation facilities; establish bulk supply points (BSPs), in addition to the required MV and LV network to evacuate the area generation from the BSPs. The plan should be considered the minimum requirement to meet the forecast demand whilst complying with the planning criteria. The plan shall also include a detailed design of the facilities, associated bills of quantities and an estimate investment costs for each of the integrated network. The consultant shall also provide a prioritized list of investments (each covering the integrated sub-transmission, BSP, MV and LV network requirements).

14. **Capacity Building**. Substantial part of the training will be provided by the Consultant's staff as part of the on-the-job-training and formal training of the counterpart staff.

15. **Deliverables.** The deliverables associated with the assignment are generally reports. PowerPoint slides and Excel spreadsheets will also be requested in support of the assignment. All materials provided shall be in English. The description and estimated timing (calendar weeks or months, starting from contract signature) for the main deliverables are outlined below.

#	Tasks and Deliverables	Time Period (Following Contract Signature)
1	Inception Report	End of first Month
2	Distribution network design showing full layout design with manual (Technical Specifications)	End of Third Month
3	Network Modelling Report (showing the routs for the Transmission and distribution networks) with ADMS	End of Third Month
4	Integrated Distribution Master Plan Investment with financial analysis	End of Fourth Month
5	Specialized Training and Experience Sharing Workshops	Continuous.
6	Final Report	End of Six month

16. **Consultant Qualifications.** The consultancy firm shall have experience of at least 10 years in the electricity sector, with significant experience in power distribution system planning and operations. Practical experience in implementation of distribution reinforcement and expansion projects would be considered as an advantage. The firm shall have experience working in similar sector and systems as the client's country. Proposals shall clearly highlight the qualifications and experience of the team leader and key experts of direct relevance to conduct the tasks outlined under the scope of works above, as these dimensions will be heavily weighted in the technical evaluation of proposals submitted. Personnel in the Consultant's team should together have demonstrably proven in-depth experience in addressing the full range of functional and technical expertise outlined in this ToRs, to successfully undertake this assignment and on a timely basis.
17. **Staffing.** It is expected that at least four (4) specialists will be engaged on a full time basis and based in the field for most of the assignment duration, including a senior expert (Team Leader / Power Planning Specialist**)** who will act as the project manager and the client interface, distribution network modeling and design specialists (1), distribution system network operations experts (1), and environmental and social expert (1). Key personnel shall have the minimum qualifications highlighted below. The Consultant is expected to have key experts full time resident in Somali to ensure effective and adequate collection of information and data, hands-on knowledge transfer and consultation with/presentation to stakeholders. A consultant proposing key personnel who are not able to travel/reside in Somali for the duration of the assignment will be considered as non-responsive.

    (i) Team Leader / Power Planning Specialist. At least Master's degree in Electrical Engineering with a minimum 15 years of professional experience in power transmission and distribution planning and modeling, line design, system analysis, operation, software-based data analysis and maintenance of electric utility. S/he will be responsible for successful implementation of the project. S/he must have working experience in electric utilities of developing countries on distribution and transmission system planning, facility design, system loss reduction and maintenance**.**

    (ii) **Power Transmission and Distribution Modelling and Design Expert.** At least Master's degree in Electrical Engineering with a minimum 10 years of professional experience in power T&D planning and modeling, design and grid operation. S/he will assist the Team Leader to carry out the project implementation.

    (iii) **Distribution System Operations Expert**. At least Bachelor's degree in electrical engineering with minimum 10 years professional experience in electric utility. The Distribution Modeling Engineer will assist the Power Distribution Planning Specialist to conduct modeling of the distribution network of each load center and specifically assist in data preparation, metering and system analysis. S/he must have adequate knowledge in latest distribution software and network analysis.

    (iv) **Environmental and Social Experts:** The Consultant's team shall also include one or more environmental and social experts to assess the proposals risks and guide the formulation of appropriate mitigation measures in accordance with the evaluation benchmarks of the World

Bank Group Environmental and Social Framework (ESF). A bachelor's or master's degree in natural or social sciences, ideally majoring in environmental protection or a comparable qualification in environmental planning, is required.

18. **Consultant Responsibilities**. The Consultant shall be responsible for obtaining relevant information required for the assignment. The Consultant shall be responsible for all travel, security and accommodation arrangements for their staff as required.

19. **Security Arrangements**. The Consultant shall be responsible of ensuring security of their staff, especially in Somalia when undertaking activities related to this assignment. The Consultant shall include in their proposal an emergency/contingency plan detailing how the Consultant proposes to continue performance of services in case of a security incident. In addition, the Consultant proposal shall provide details of a robust security arrangements, and these will be part of the factors to be evaluated. The Emergency Plan and Security details shall be evaluated as part of the proposal assessment.

20. **Duration of the Assignment**. Consultancy services will be provided over a period of six (6) calendar months from the contract effectiveness date with an estimated effort of about 30 man-months (25-manmonths for key experts and 5-man-months for backstopping and part time experts).

21. **Type of Contract shall be "The Lump Sum Fee Plus Reimbursable Expenses".** The Consultant's total remuneration shall not exceed the Contract Price and shall consist of (i) a fixed lump sum fee including all Consultant's Personnel costs; plus (ii) reimbursable expenses actually and reasonably incurred by the Consultant and/or its Personnel, in the performance of the Services.

Payment Terms. Payments shall be prorated to the following approved key deliverables

#	Tasks and Deliverables	Percentage (%) of Contract Amount
1	Inception Report	15
2	Distribution network design manual	15
3	Network Modelling Report	30
4	Integrated Distribution Master Investment Plans	30
5	Final Report	10

22. **Facilities to be provided by the Client**. The client shall provide the following facilities to the consultant (a) Access to all available relevant information, such as reports and studies, network data and operating statistics and (b) Counterpart staff and as part of training and knowledge transfer. The counterpart staff shall be paid by the client.

23. **Facilities to be provided by the Consultant**. The Consultant shall be responsible for providing all the necessary facilities to undertake the assignment including the necessary software, local transport, security, office space and accommodation. The Consultant shall include the cost for the above responsibilities and facilities in the proposed price.