Terms of Reference[1]

Engineering Services for Preparation and Support with Implementation Supervision to Electricite de Liban (EDL)

Lebanon Renewable Energy and System Reinforcement Project

1 Background

1.1 Introduction

Electricité du Liban (EDL), the vertically integrated national utility, is responsible for electricity generation (except for limited long-standing private hydropower concessions), transmission, and distribution except for a few localized distribution concessions. EDL operates under the administrative oversight of the Ministry of Energy and Water (MOEW) and the financial oversight of the Ministry of Finance (MOF), though overall responsibility for the sector and its reforms rests with the Council of Ministers (COM).

EDL owns and operates approximately 1,5 GW of available capacity, connected to EDL grid which comprises 400, 220, 150, and 66 kV voltage levels –

Figure 1.

1.2 The Project

World Bank is financing a project that focuses on improving the reliability of electricity transmission network, improve efficiency of EDL operations, and increase the supply of grid-connected renewable energy to consumers (the "Project"). For EDL, the Project has several Activities, namely:

- **Activity 1: Strengthening of EDL Operational Systems**. This Activity will finance the following: (a) construction of a new National Control Center (NCC) building with its associated auxiliary system at a new site after demolition AL Chiah old building within the perimeter of EDL headquarters territory in Beirut; (b) supply, install, commission and testing of Supervisory Control and Data Acquisition (SCADA) system, Energy Management System (EMS), telecommunication equipment and its related management systems with the rest of EDL's substations/Power Plants and feeders, and renewable energy plants, and reserve power supply equipment at NCC node for NCC in the case of emergencies, and dispatch control; (c) as needed, replace/upgrade/rehabilitate Remote Terminal Units and telecom network to ensure full connectivity between EDL substations/Power Plants and the new NCC; and (d) three-year software maintenance contract for all relevant operational software required for NCC and seven years software and hardware warranty for all the installed equipment, (e) training of EDL staff to ensure EDL acquires the required experience and knowledge, including through on-job training on the NCC systems.
- **Activity 2: Strengthening of EDL Commercial Systems**. This Activity will finance the EDL's Center for Advanced Metering Infrastructure (AMI). The AMI center will be comprised of, but not limited to, Headend System (HE), Meter Data Management (MDM), Customer Relationship Management (CRM), billing system, consumer portal, Telecommunication system Key Management system (KMS), etc. The billing system within the AMI center will comprise the invoicing, collection and

[1] *Firms may note that the contract packages, the selection method, market approaches and uses of appropriate Standard Procurement will be further refined and appropriately reflected in the Terms of Reference at time of issue of Request for Proposal to the shortlisted firms*

reporting functionalities. A detailed business process improvement plan shall be developed and implemented, . This Activity will not finance the procurement and installation of the smart meters, which falls within the scope of the DSPs that have contractual arrangements with EDL.

- **Activity 3: Development of Grid-connected Solar PV Plants**. This Activity will finance the following: (a) construction of about 150 MW of utility-scale solar PV power plants, which includes: design, supply, and installation of the solar PV modules, inverters, and the balance of the plant comprised of structural Activities, electrical Activities, control and monitoring systems, auxiliary systems, and civil works; and (b) two-year O&M contract for the solar PV projects to be constructed to ensure EDL acquires the required experience and knowledge, including through on-job training. The potential sites identified is Hermel, Ras Baalbek and Qaa, (. The selection of PV site areas was carried out taking into account, among other factors, also proximity to existing network to minimize the length of new power lines to be constructed.
- **Activity 4: Strengthening of EDL Transmission Network.** This Activity would finance the following:

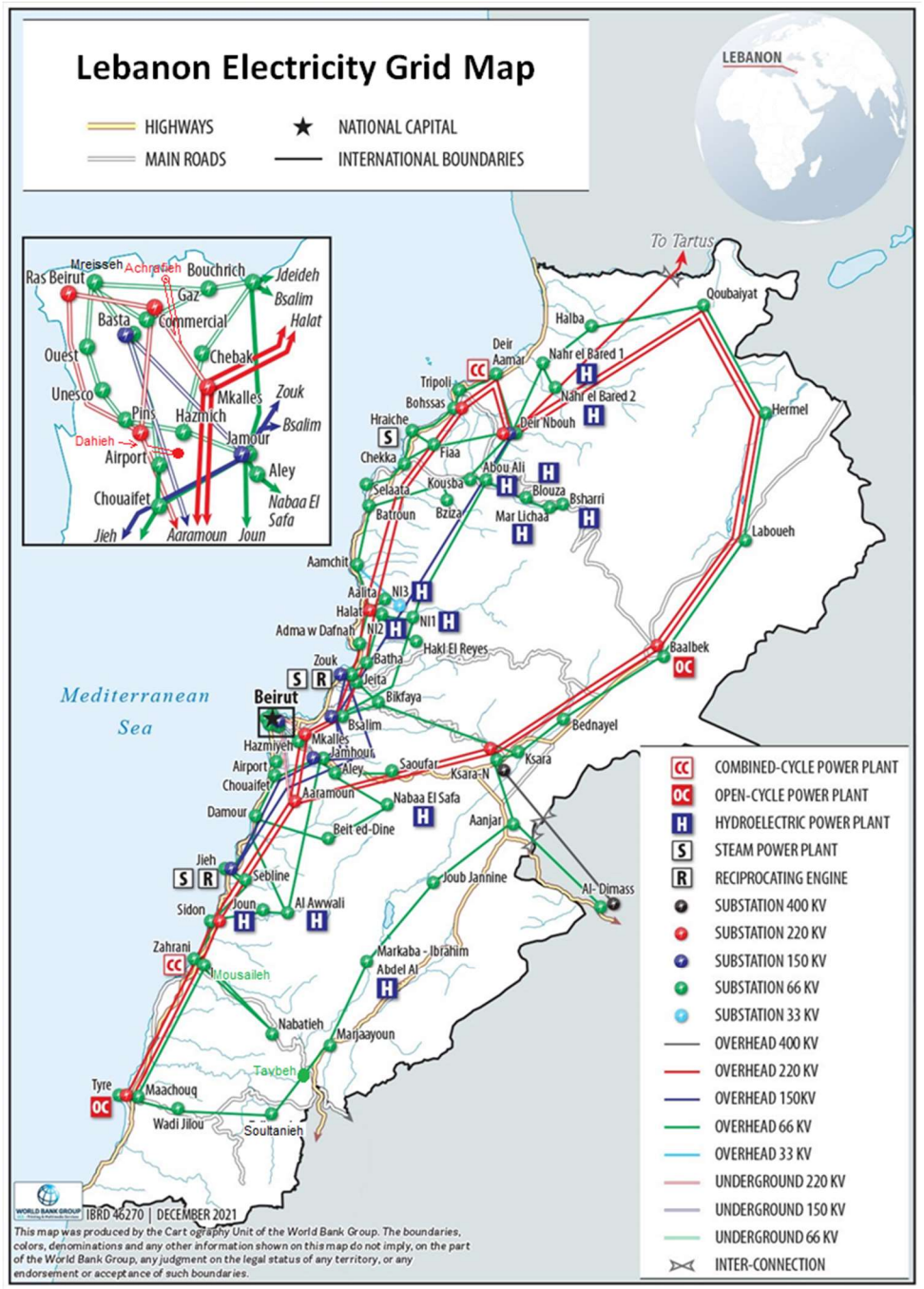
    a. **Rehabilitation of Ashrafia 220 kV substation**. This will include rehabilitation or replacement of high voltage and auxiliary transformers, replacement of switchgear, busbars, disconnecting switches, capacitor banks and the secondary equipment, along with the required civil works.

    b. **Rehabilitation of 220 kV Deir Nbouh – Baalbeck overhead transmission line (OHL)**. This would include supply and installation of damaged towers, partial replacement of conductors, insulators, optical ground wire, and other required equipment.

    c. **Adding two 220KV new bays in Baalback substation and associated control and protection panels and other necessary works at Baalbek substation in order to improve the reliability of the Northern 220 kV loop.**

    d. **Connection of solar PV plants to the grid**. This would finance construction of power lines and required connection points at existing substations/Power Plants to connect the solar PV plants, to be constructed under Activity 3, to EDL's network.

Figure 1 EDL Transmission Grid Map



2 Objective

Going forward, EDL will need support with finalizing the preparation of these four Activities and carrying out the necessary supervision during the construction phase (technical, environmental and social, financial management). The contract for the consultancy services will be signed with EDL (the Client). The Consultant is expected to provide the required support and participate in the discussions and meeting with EDL and other stakeholders as may be required during implementation of this assignment.

For each of the Project's Activities listed under Section 1, the objective of the consulting services is to prepare for the Client approval the: (a) technical definition of and preparation of detailed technical specifications and necessary engineering drawings; (b) preparation of all necessary environmental and social instruments in line with the World Bank guidelines, (c) preparation of bidding documents (BDs) and carrying out the tenders for procurement of the Contractor; and (c) technical supervision of the Project during implementation. This will include but not limited to Project management and works/commissioning supervision; review and approval of the detailed engineering submittals provided by the EPC Contractor(s); monitoring of Project's compliance with the requirements of environmental and social documents under the Project and the requirements of the national environmental legislation; and preparation of the necessary progress reports. The Consultant will support the Client to execute its responsibilities for the financial management of Project-related activities, including issuance of payments certificates to the Client, assessment of proposed change orders, cost analysis, analysis of EPC contractors' claims, etc.

For each of the four Activities, and notwithstanding the rest of this document, the scope of work will be comprised of Part A and Part B:

a. Part A- Project Preparation and Tendering Stage - includes review of existing studies, technical definition of the Project, estimation of the Project cost, preparation of bidding documents (BDs) for procurement of the Contractor required for various parts of the Project, and support to with carrying out the procurement and selection of the EPC Contractors of each Activity. Part A services will be lump sum based contract.

b. Part B – EPC Contract Management and Construction Supervision - includes technical supervision of the Project implementation, including

    i. Project management of the process associated with delivering the Contractor scope of works

    ii. Review and advise recommendation to EDL related any claims, issues, technical disputes, the

    iii. recommendation shall be based on Lebanese Law, EPC Contract Documents as the case may be and as applicable

    iv. Review contractor's time schedule to ensure that it meets project milestones and contractual completion date.

    v. Consultant shall engage experienced planning engineer to check projects schedules from EPC contractors responsible for different lots , identify key issues and alert for required remedial / mitigation measures to accomplish required energization target date.

vi. Review, recommend and approve Contractor's material submittals, shop drawings and attend all testing activities for the materials to ensure that it meets specifications and the equipment performance properly.

vii. Review, recommend and approve Contractor's technical submittals including studies, method statements for construction, commissioning works and Application for Works Perform site supervision to meet standards-safety (HSE), work & Review/ Approval of Application for Work (AFW) security and reliability during the execution stages and warranty period.

viii. Perform site supervision to meet the World Bank relevant environmental and social standards (ESSs), , requirements of environmental and social documents (ESCP, SEP and LMP), World Bank Group General Environmental, Health & Safety Guidelines (EHSG) and World Bank Group Environmental, Health & Safety Guidelines for Electric Power Transmission and Distribution (2007) work & Review/ Approval of Application for Work (AFW) security and reliability during the execution stages and warranty period.

ix. Prepare monthly progress reports detailing site activities, during the reporting period and outlining the works to be performed during the next month

x. Prepare a separate monthly environmental, social, and health & safety performance reports, including.

xi. Immediately report project-related incidents and accidents to the employer.

xii. Monitor and control the project progress, evaluate in monthly basis projects delays if any, and report all delays to EDL and follow up with contractor to mitigate for any delays.

xiii. Review and submit on a monthly basis in hardcopy and Primavera P6 compatible electronic format contractor’s work program.

xiv. Maintaining Risk Register throughout the project life cycle.

xv. Monitoring contractors’ performance on the project and report to EDL on biweekly basis.

xvi. Supervise the contractor’s performance to ensure that safety rules and procedures, environmental and social measures are implemented by contractors in accordance with the ESMP, LMP, SEP and other relevant E&S documents.

xvii. Attending Factory Acceptance tests

xviii. Supervise Site Construction, Testing and Commissioning activities.

xix. review of design, construction supervision, advice on acceptance of works, contract management, and other. Part B will be time-based contract (services are provided on the basis of fixed fee rates and payments are made on the basis of time actually spent).

3 Scope of Work of Consultancy Services[2,3]:

3.1 Activity 1 – Establishing a National Control Centre

EDL plans to establish a new NCC within its premises in Beirut to replace the one damaged during the 2020 Beirut Port blast. This includes establishing a new building, with its associated auxiliary systems, complete with all IT and OT systems for an NCC, SCADA/EMS Systems, as well as rehabilitating any necessary RTUs and telecommunication channels between existing EDL substations/Power Plants and the new EDL. The Part A will include finalizing NCC site selection, detailed preparation of bidding documents (BDs) for EPC contractor for EDL's Project Activities, and evaluation of EPC bids and other support to the Client.

The New NCC aims at implementing the full-scale state-of-the-art SCADA, EMS and telecommunication systems to monitor and manage in a safe and reliable manner the relevant electrical network as well as monitoring energy exchanges on the transmission network and generation all over the country.

The project shall include construction of the NCC building with its associated auxiliary systems, related adaptation works at relevant substations/Power Plants including necessary rehabilitation of Remote Terminal Units (RTUs) and necessary rehabilitation of telecom network between EDL substations /Power Plants and the new NCC. The major Activities for New National Energy Control Centre (N-NECC) are as follows:

- SCADA & EMS Systems
- Control Centre Building and associated Auxiliary Systems
- Fibre Optic Cables & Telecommunication Network.
- Renewable Energy management and real time forecast (solar & Wind).
- Training
- Remote Terminal Units, telecom equipment and Adaptation Works at the EDL substations/Power plants as needed.
- Rehabilitation of all fiber optics cuts as well as optimizing microwave links.

3.1.1 NCC Building & Associated Auxiliary Systems

EDL plans to install the new NCC building within its premises in Beirut, where the location shall ensure full alignment with international best practices for NCC requirements, such as independence and security, redundancy of power supply, and accessibility. The design of the new NCC will ensure a modern, secure, and functional layout, and meet the operational needs of the NCC while providing necessary amenities and maintaining aesthetic standards. It is expected that the new NCC new NCC building is designed with Four (4) floors plus the Basement and the Ground floor to accommodate 150 people, as well as hosting

[2] Throughout this document, for tasks under the word "assist", it is understood that the Consultant shall have the full responsibility for the respective tasks, which doesn't exclude the authority given to the Client by local law.

[3] The Consultant shall confirm these requirements and advise of any necessary changes/deviations.

the necessary power equipment to supply power to the NCC (transformers, generator, and power supply connections to ensure efficient and reliable operation of the infrastructure), within a total area of approximately 4,700 square meters. The works for New NCC Building shall include the following (not exhaustive):

- Demolish of the existing Chaih building
- Design and Build New NCC Building, including all structural, architectural, civil, electrical & mechanical works, finishing and landscaping. The final building design and number of floors shall consider the staffing requirements. The building will have separate grounding system suitable for similar establishments according to international best practices.
- State of the art Control Room design equipped with complete operator's facilities and full-scale Video Wall Display with the associated software.
- All auxiliary systems, including separate system grounding, Diesel Generator, UPS systems, , Building Management System, Security System, HVAC System, Fire Fighting System, fire detection system , hydrant system , plumping system , earthing system , access door system , CCTV system, etc.

3.1.2 SCADA & EMS system

New SCADA and EMS system shall be provided for the NCC incorporating the following (not exhaustive):

- SCADA system for the NCC sized to manage relevant electrical network requirements for minimum 10 years, to facilitate safe and effective operation of EDL's transmission network
- The SCADA architecture shall be state-of-the-art, incorporating redundancy.
- Hardware (including servers, LAN, workstations, standard CIM interfaces, video wall display, local RTU, weather station, ….)
- SCADA software (including data acquisition, data calculation, sequence of event, reports & trends, alarm & events processing, supervisory control, dynamic network coloring, historical & retrieval information systems)
- Cyber Security features
- EMS applications:
    - PNA (including state estimator, short circuit calculations, contingency analysis, load shedding functionality, VSAT(voltage stability) and TSAT(transient stability).
    - AGC (Automatic Generation Control)
    - UC (Unit Commitment).
    - Dispatcher training simulator (DTS)

3.1.3 RTU & Telecom Equipment/Network Rehabilitation Works (if needed)

Existing EDL grid (including substations and power plants) are equipped with automation equipment (e.g. RTUs) at each site. The telecommunication network serving EDL NCC includes variety of equipment such as SDH Fiber Optic (SDH F.O), PDH (PDH), Digital Microwave (MW), Digital Power Line Carrier (DPLC) as well as Analog Power Line Carrier (APLC) equipment Given the age and condition of some of these facilities, there might be an EPC scope of work to rehabilitee this equipment. The OE shall confirm the needed rehabilitation work based on detailed site surveys and measurements.

3.1.4 Training

The training provisions shall be included in EPC Project for the operation and management of all systems / equipment. The works for the Training shall include the following operational training (not exhaustive):

- Dispatcher's training
- SCADA hardware training
- SCADA applications & software training.
- EMS applications & software training.
- Telecom equipment, telecom network, RTU and SCMS training.
- Balance of Plant/Auxiliary systems training

The OE will advise of any additional necessary training for EDL staff to fully operationalize the new NCC after project handover from the EPC contractor.

3.2 Scope of Consultancy Service:

3.2.1 Scope of Consultancy Service during Part A - Project Preparation and Tendering Stage (Lump Sum Based Contract):

Task A-1: Review of existing technical, engineering, and other studies. This will be comprised of the following main activities.

a. Obtain all information and data from the Client and analyze the requirements.

b. Review existing studies and assess whether any updates may be required considering the existing and planned scope of work for EDL's NCC.

c. Complement the technical analysis that may be needed to finalize technical definition of the EDL's NCC and preparation of technical specifications, including but not limited to the necessary technical analyses, site surveys, geotechnical studies, and environmental, social and health & safety studies.

d. Detailed site surveys to identify all rehabilitation works needed at EDL substations/Power Plants to ensure full integration with the new NCC (RTUs, substation telecom equipment, 48 VDC systems, telecom links, etc).

Task A-2: Technical definition of NCC and the associated Rehabilitation Works. This will include detailed technical definition and engineering specifications for all elements of this Project Activity (NCC and respective substations/Power Plants telecom and RTU rehabilitation) after completing necessary technical analyses, site surveys, and other assessments. This includes but is not limited to confirming selection of NCC site, NCC platforms and software for EMS and other necessary services, NCC building layout and functional requirements, and provide design and functional specifications for all needed equipment and systems, including all balance of plant Activities and necessary RTU and telecom rehabilitation to ensure full integration of EDL's substations/Power Plants with the new NCC.

Task A-3: Construction and O&M cost estimates: The Consultant will carry out the following main tasks:

a. Estimate the Base Case construction costs of the EDL's Activities of Project based on the Consultant's experience, recent tenders, and market study of latest similar projects. The construction cost break-down should be prepared separately for each of the Project's Activities, and should include, but not limited to the following items.

- Development costs, which are comprised of: (i) project management and engineering, and (ii) planning and consenting, including certification of project and interaction with local authorities.
- Capital expenditure, which are comprised of: equipment installation, cost of supply and installation of wet and dry plant, and system commissioning.
- Land acquisition and mitigation costs of environmental and social impacts. These costs would be finalized as part of the parallel environmental and social studies for the Project's Activities.
- Incremental O&M cost considering the changes in the annual O&M costs driven by the ageing of the infrastructure.

Task A-4: Preparation of the environmental and social (E&S) E&S instruments required for the Project Activity 1. The Consultant will:

a. Identify the environmental, social and health & safety risks and impacts which are potentially associated with the demolition of the existing Chiah building, design, construction and operation of the new NCC.

b. Prepare a site-specific Environmental and Social Management Plan (ESMP) appropriate to the nature and scale of the proposed new NCC building. The ESMP shall be concise, focusing on the key risks and impacts of the planned activities, and determining the necessary mitigation measures while applying the risk mitigation hierarchy principles prioritizing the avoidance and minimization to the extent possible of environmental and social impacts during the different phases of the NCC life cycle. The ESMP shall comply with the World Bank Environmental and Social Standards relevant to the project, the project Environmental and Social Commitment Plan (ESCP), the Stakeholders Engagement Plan (SEP) and the Labor Management Procedures (LMP).

c. Consult with key stakeholders regarding the overall risks and impacts, proposed mitigation measures and incorporate their feedback and relevant concerns into the NCC building designs as well as the ESMP.

d. Prepare the Terms of Reference for the EPC contractor to develop both a Construction Environmental and Social Management Plan (C-ESMP) and a comprehensive standalone occupational health and safety risk assessment. The C-ESMP should be consistent with the relevant World Bank Environmental and Social Standards (ESSs) and the employer's ESMP, covering: (i) the decommissioning of the old NCC (including management of asbestos containing material, if any), (ii) the detailed design of the new NCC, and (iii) the construction of the new NCC. The occupational health and safety risk assessment should address all activities during both the old NCC decommissioning and the new NCC reconstruction phases.

The ESMP should be prepared in a manner where it can be included in the bidding documents with clear description of contractors and operators' roles and responsibilities at each phase of the sub-Project.

E .Prepare Project level Labor Management Procedures (LMP) which will be applicable to Activities 1 – 4, in line with ESCP and World Bank's Environmental and Social Standard 2: Labor and Working Conditions requirements. The LMP should be prepared in a manner where it can be included in the bidding documents with clear description of contractors and operators' roles and responsibilities at each phase of the sub-Project. The LMP will be disclosed and consulted upon. The LMP Terms of Reference is included in the Annex 2.

e. ~~The preparation of the required E&S instruments would be prepared under a separate assignment with a different consultant.~~

Task A-5: **Preparation of procurement documents, implementation schedule, and support during tenders till Award of EPC contracts:** This task will include the following:

a. Preparation of BDs based on functional/preliminary designs for all Project Activities based on the technical definitions covered under Task 2 and drawing upon the current design standards and codes of practice used by the Client, current international standards, environmental and social requirements consistent with the World Bank ESSs, and other applicable conditions.

b. Preparation of the design including all equipment specifications, performance specifications, installation and commissioning schedules covering following tasks: preparation, procurement actions up to award of the contract, contract negotiations, and detailed construction activities up to hand-over after testing and commissioning. The Consultant should also confirm that the overall construction schedule of the project is realistic.

c. Support the Client with organization and implementation of the tender for procurement of EPC for each project Activity, including, but not limited to: (a) publication of BDs; (b) preparation of answers, clarifications and addendum (if necessary) to be provided to potential bidders during tendering procurement phase; (c) assist the client in conducting of the pre-bid meeting; (d) evaluation of bids and preparation of bid evaluation report for the client (e) assist the client in conducting the pre-award meeting with the lowest cost evaluated bidder; and (g) drafting of the Contract for the client approval and addressing of other issues to finalize the Contract.

d. Prepare for the client approval the implementation schedules and the procurement strategy for construction of each of the Project's Activities. The review is required to ensure that timing of works and activities is synchronized with the schedule for the NCC platforms to ensure the overall Project can be commissioned without delays.

e. Prepare for the client approval the answering queries from the potential bidders, clarifications, correspondences, meetings, reporting, etc.

f. Thorough examination of received bids

g. Participation in bids evaluation process, including both technical and commercial bids

h. Preparation of Final Bids Evaluation Report

i. Assistance to EDL in contract negotiations and contract award

j. Preparation of EPC Contract Document for awarded Contractor

k. EPC Contract Document shall be the outcome of the Stage II.

3.2.2 Scope of Consultancy Service during Part B - EPC Contract Management and Construction Supervision (Time Based Contract):

This part of the assignment is to cover the construction supervision including ensuring EPC contractor's compliance with E&S requirements, contract management, as well as factory testing related to all Activities.

Task B-1: Design Review: This task will include the following:

The Consultant will review and comment on proposed location of equipment and facilities, schedule of installation, review and recommend for the client approval of bill of quantities and final price schedule submitted by the Contractors for each of the Project Activities. The Consultant will review and comment on all design and drawings and technical documents submitted by the Contractor including manufacturers' drawings and material submittals. The review should be carried out in close association with EDL team. During this period, the Consultant will also prepare any spreadsheets required for design and prepare a manual for checking drawings of relevant buildings, equipment**,** foundations. Under this task the Consultant is specifically expected to:

- Review and comment on all aspects of design, standards, and deviations proposed by the Contractor.
- Check and ensure that Contractor provides calculations, drawings and design in accordance with technical specifications in the BDs.
- Review the results of investigations and surveys done by the Contractor.
- Maintain a dialogue with the Contractor's design staff to review and comment on Contractor's design documentation.
- Ensure that design-related environmental and social mitigation measures are adequately incorporated into the designs, technical specifications, and bill of quantities.
- Review final design, submitted by the Contractor, and provide recommendations to EDL regarding its approval.
- Attend design review and progress meetings (as required by the Project Managers at EDL).

Update the client on a weekly basis about the progress of this task.

Task B-2 - Construction Supervision, Quality Assurance and Inspection

- Review and comment on engineering documents such as: (a) detailed design prepared by the Contractor and final working drawings submitted by manufacturers, (b) equipment specifications; and (c) installation procedures.
- Compare detailed specifications, quality and quantity of major equipment with those specified and required by the technical specifications in the BDs.
- Conduct construction supervision during the period of construction works and monitor construction schedule and inform the client of any delays.
- Monitor construction progress of all Project Activities.
- Prepare a detailed Project Control Program using MS Project (or Primavera P6) to provide charts, curves and detailed reports of critical activities, percentage completion, interface points, etc. for design, procurement, installation, and commissioning.

- Hold regular planning and progress review meetings to monitor the Contractor's work progress. If delays or problems are observed, the Consultant shall issue notifications to EDL.
- Prepare monthly progress report and comprehensive quarterly progress report and send them to EDL no later than 10 days after completion of each quarter.
- Assist EDL with overall quality assurance.
- Monitor construction at sites and manufacturing process in factories and advise EDL on quality assurance issues if necessary.
- Monitor Social and Environmental compliance with the bidding documents and contracts, including Health and Safety procedures at construction sites. Suggest the measures to be taken in order to avoid or mitigate possible safety risks during construction and supervise implementation of such measures.

Task B-3 - Supervision of Contractors' Compliance with E&S Requirements under Project Activity 1

- Ensure adherence of the Contractor's performance with the Client's Environmental & Social Management Plan (ESMP) and the Code of Conduct of Contractors.
- Receive, review, comment upon, and advice the client to approve Contractor's ESMP (C-ESMP).
- Receive, review, comment upon, and advice the client to approve Contractor's OHS Risk Assessment.
- Undertake environmental and social monitoring of the Contractor's performance according to the ESMP of the Client, LMP, SEP, C-ESMP and the OHS Risk Assessment.
- Identify any unexpected environmental, social and health & safety issues that had not been covered by ESMP, C-ESMP, LMP, SEP, OHS Risk Assessment, notify Client on them, and work out response measures.
- Identify cases of environmental, social, and health & safety non-compliances, if any, and assess damage done.
- Recommend and agree on the corrective actions with the Client and follow up on their implementation by the Contractor.
- Ensure that the Contractor establishes and maintains the Grievance Redress Mechanism (GRM) and include respective information in the progress reports.
- Ensure that the Contractor complies with the project Labor Management Plan (LMP), including provisions on Occupational Health and Safety, and Code of Conduct. Report any non-compliance with LMP to the Client and oversee implementation of corrective measures.
- Check contractor's training records pertaining to environmental, social and OHS aspects.
- Promptly report any project-related incidents to the Client.

Task B-4 - Contract Management

- Review invoices submitted by the Contractor in accordance with price adjustment provisions and advise EDL on approval of those invoices.
- Control project implementation schedules (construction, supply, and budgeting schedule) prepared and submitted by the Contractor.

- Review and advice on remedy action that should be taken by the Contractor, estimate the delays required to make up, and resolve schedule constraints during construction period.
- Assist EDL in resolving disputes and claims raised by the Contractor.
- Rate extra/additional work to be carried out by the Contractor and recommend rates for such work to EDL.
- Describe any variation of project cost and implementation time from the originals and explain causes, effects and countermeasures to EDL.
- Review contract change-order procedures for design, supply and installation contract for the substations/Power Plants, and identify any potential flaws and suggest changes.
- Manage and control all variation order and contract amendment procedures.
- Review and compile as-built drawings and review the operation and maintenance manual provided by the Contractor for accuracy and adequacy.
- Ensure timely preparation and submission of environmental and social reports.
- Advise the Client on environmental, social, and health & safety contractor's non-compliances and proportiante disciplinary measures in accordance with relevant contract clauses.

Task B-5 - Support to EDL related to factory test of materials and equipment, and guarantee testing and commissioning

- Support EDL in all aspects related to the factory tests organized by the Contractor, including but not limited to: inspections and witnessing of acceptance tests during manufacturing (factory test) of materials and equipment to be supplied for the Project.
- Review commissioning plan and program.
- Witness and assist EDL during guarantee testing and commissioning.
- Prepare the Certificate of Construction Completion (CCC) and the Certificate of Operational Acceptance (COA).

3.3 Activity 2 – Strengthening of EDL's Commercial Systems and Operations

This Activity involves financing the incorporation by EDL of: (i) a Commercial Management System (CMS) to directly carry out billing and other operations of the revenue cycle of post-payment customers, manage prepayment customers and monitor performance of DSPs in their commercial operations; (ii) Advanced Metering Infrastructure (AMI) through the installation of a Meter Data Management System (MDMS) to analyze data provided by smart meters to be installed by DSPs and enable optimization of operations related to revenue enhancement and protection and others of the revenue cycle; (iii) interfaces between MDMS and the head end systems (HES) to be deployed by the DSPs; (iv) a Data Center to host the information technology (IT) infrastructure and auxiliaries required for the efficient execution of commercial operations (by EDL and DSPs) supported by CMS and MDMS; . The overall CMS/AMI solution aims to provide the necessary tools to to enhance the commercial operations of EDL, namely: revenue cycle of post-payment customers, management of prepayment customers, commercial field works, energy losses reduction and customers relationship. Given the new Renewable Energy law, it is important to also facilitate net metering schemes for renewable system owners through AMI concept. EDL shall not be responsible for installing any smart meters under this Activity as this lies within the scope of the Distribution Service Providers (DSPs).

3.3.1 Scope of Consultancy Service during Part A - Project Preparation and Tendering Stage (Lump Sum Based Contract):

Task A-1: Review of existing technical, engineering, and other studies. This will be comprised of the following main activities.

a. Obtain all information and data from the Client and analyze the requirements.

b. Review existing studies and assess whether any updates may be required considering the existing and planned plans to roll out smart meters by the DSPs.

c. Complement the technical analysis that may be needed to finalize technical and functional definition of the EDL's CMS/AMI solution and preparation of technical and functional specifications.

d. Detailed site surveys to identify all system integration work with DSP systems and in place/planned smart meters.

- **Task A-2: Preparation of technical and functional specifications of EDL's CMS/AMI solution.** This will include the definition of detailed technical and functional specifications for all components of the solution in the scope of the Project Activity, including supply and installation of CMS and MDMS, development of interfaces with HES of DSPs, Data Center to host the IT infrastructure and auxiliaries needed for efficient and smooth operation of all software packages, etc.

Task A-3: Construction and O&M cost estimates: The Consultant will carry out the following main tasks:

a. Estimate the Base Case supply and installation (S&I) costs of the EDL's Activities of Project based on the Consultant's experience, recent tenders, and market study of latest similar

projects. The construction cost break-down should be prepared separately for each of the Project's Activities and should include, but not limited to the following items.

- Development costs, which are comprised of: (i) project management and engineering, and (ii) planning and consenting, including certification of project and interaction with local authorities.
- Capital expenditure, which are comprised of: equipment installation, cost of supply and installation of wet and dry plant, and system commissioning.
- Mitigation costs of any possible environmental and social impacts. These costs would be finalized as part of the parallel environmental and social studies for the Project's Activities.
- Incremental O&M cost considering the changes in the annual O&M costs driven by the ageing of the infrastructure, as applicable.

Task A-4: **Preparation of procurement documents, implementation schedule, and support during tenders till award of S&I contracts:** This task will include the following:

l. Preparation of bidding documents (BDs) based on functional/preliminary designs for all Project Activities based on the technical definitions covered under Task 2 and drawing upon the current design standards and codes of practice used by the Client, current international standards, relevant World Bank environmental and social standards, and other applicable conditions.

m. Preparation of the design including all equipment specifications, performance specifications, installation and commissioning schedules covering following tasks: preparation, procurement actions up to award of the contract, pre-award discussions, and detailed supply and installation activities up to hand-over after testing and commissioning. The Consultant should also confirm that the overall implementation schedule of the project is realistic.

n. Support the Client with organization and implementation of the tender for procurement of S&I for each project Activity, including, but not limited to: (a) publication of BDs; (b) clarifications and addendum (if necessary) to be provided to potential bidders during tendering procurement phase; (c) conduct of the pre-bid meeting; (d) evaluation of bids and preparation of bid evaluation report; (e) pre-award meeting with the lowest cost evaluated bidder; and (g) addressing of other issues to finalize the contract.

o. Prepare the implementation schedules and prepare the procurement strategy for construction of each of the Project's Activities. The review is required to ensure that timing of works and activities is synchronized with the schedule for the NCC platforms to ensure the overall project can be commissioned without delays.

p. Participation in answering queries from the potential bidders, clarifications, correspondences, meetings, reporting, etc.

q. Thorough examination of received bids.

r. Participation in bids evaluation process, including both technical and commercial bids.

s. Preparation of Final Bids Evaluation Report.

t. Assistance to EDL in contract award

u. Perfectioning S&I contract documents.

3.3.2 Scope of Consultancy Service during Part B - EPC Contract Management and Supply and Installation Supervision (Time Based Contract):

This part of the assignment is to cover the supply and installation supervision including ensuring EPC contractor's compliance with applicable E&S requirements, contract management, as well as factory testing related to all Activities.

Task B-1: Design Review: This task will include the following:

The Consultant will review and comment on proposed location of equipment and facilities, schedule of installation, review and recommend approval of bill of quantities and final price schedule submitted by the Contractors for each of the Project Activities. The Consultant will review and comment on all design and drawings and technical documents submitted by the Contractor including manufacturers' drawings and material submittals. The review should be carried out in close association with EDL team. During this period, the Consultant will also prepare any spreadsheets required for design and prepare a manual for checking drawings of relevant buildings, equipment**,** foundations. Under this task the Consultant is specifically expected to:

- Review and comment on all aspects of design, standards, and eventual changes proposed by the Contractor.
- Check and ensure that Contractor provides calculations, drawings and design in accordance with technical specifications in the BDs.
- Maintain a dialogue with the Contractor's design staff to review and comment on Contractor's design documentation.
- Ensure that design-related environmental and social mitigation measures are adequately incorporated into the designs, technical specifications, and bill of quantities.
- Review final design, submitted by the Contractor, and provide recommendations to EDL regarding its approval.
- Attend design review and progress meetings (as required by the Project Managers at EDL).

Task B-2 – Supply and Installation Supervision, Quality Assurance and Inspection

- Review and comment on engineering documents such as: (a) detailed design prepared by the Contractor and final working drawings submitted by manufacturers, (b) equipment specifications; and (c) installation procedures.
- Compare detailed specifications, quality and quantity of major equipment with those specified and required by the technical specifications in the BDs.
- Conduct supervision during the period of contract execution works and monitor compliance with schedule.
- Monitor progress of execution of all Project Activities.
- Prepare a detailed Project Control Program using MS Project (or Primavera P6) to provide charts, curves and detailed reports of critical activities, percentage completion, interface points, etc. for design, procurement, installation, and commissioning.
- Hold regular planning and progress review meetings to monitor the Contractor's work progress. If delays or problems are observed, the Consultant shall issue notifications to EDL.

- Prepare monthly progress report and comprehensive quarterly progress report and send them to EDL no later than 10 days after completion of each quarter.
- Assist EDL with overall quality assurance.
- Monitor construction at sites (if and as applicable) and advise EDL on quality assurance issues if necessary.
- Monitor compliance with applicable social and environmental standards prescribed in the bidding documents and contracts, including health and safety procedures. Suggest the measures to be taken in order to avoid or mitigate possible safety risks during construction and supervise implementation of such measures.

Task B-3 - Supervision of Contractors' Compliance with E&S Requirements under the Project

- Ensure adherence of the Contractor's performance with the Client's Environmental & Social Management Plan (ESMP) and the Code of Conduct of Contractors.
- Receive, review, comment upon, and approve Contractor's ESMP (C-ESMP).
- Undertake environmental, social, health and safety monitoring of the Contractor's performance according to the ESIA report and ESMP of the Client, LMP, SEP and C-ESMP.
- Identify any unexpected environmental and social, health and safety issues that had not been covered by ESMP, LMP, SEP, and C-ESMP, notify Client on them, and work out response measures.
- Identify cases of environmental and social incompliance, if any, and assess damage done.
- Recommend and agree on the corrective actions with the Client and follow up on their implementation by the Contractor.
- Ensure that the Contractor establishes and maintains the Grievance Redress Mechanism (GRM) and include respective information in the progress reports.
- Ensure that the Contractor complies with his Labor Management Plan (LMP), including provisions on Occupational Health and Safety and Code of Conduct. Report any non-compliance with LMP to the Client and oversee implementation of corrective measures.
- Promptly report any project-related incidents or accidents to the Client.
- Prepare and conduct detailed root cause analysis (RCA) and corrective action plans for work-related severe accidents (e.g. resulting in fatalities, temporary or permanent disabilities, lost work time more than 3 days, etc.).

Task B-4 - Contract Management

- Review invoices submitted by the Contractor in accordance with price adjustment provisions and advise EDL on approval of those invoices.
- Control project implementation schedules (supply, installation and budgeting schedule) prepared and submitted by the Contractor.
- Review and advice on remedy action that should be taken by the Contractor, estimate the delays required to make up, and resolve schedule constraints during S&I period.
- Assist EDL in resolving disputes and claims raised by the Contractor.

- Rate extra/additional work to be carried out by the Contractor and recommend rates for such work to EDL.
- Describe any variation of project cost and implementation time from the originals and explain causes, effects and countermeasures to EDL.
- Review contract change-order procedures for design, supply and installation contracts, and identify any potential flaws and suggest changes.
- Manage and control all variation order and contract amendment procedures.
- Review and compile as-supplied documents and review the operation and maintenance manual provided by the Contractor for accuracy and adequacy.
- Ensure environmental and social instruments and requirements are timely prepared, reflected in project detailed designs and technical specivications, and proporely incorported in contractor's contracts.

Task B-5 - Support to EDL related to factory test of hardware and software equipment, and guarantee testing and commissioning

- Support EDL in all aspects related to the factory tests organized by the Contractor, including but not limited to: inspections and witnessing of acceptance tests of equipment to be supplied for the Project.
- Review commissioning plan and program.
- Witness and assist EDL during acceptance testing and commissioning.
- Prepare the Certificate of Operational Acceptance (COA).

3.4 Activity 3 – Development of Grid-Connected Solar PV Plants

Under this Activity, EDL will build and operate approximately 150 MW of solar PV facilities, connected to its grid – Figure 3

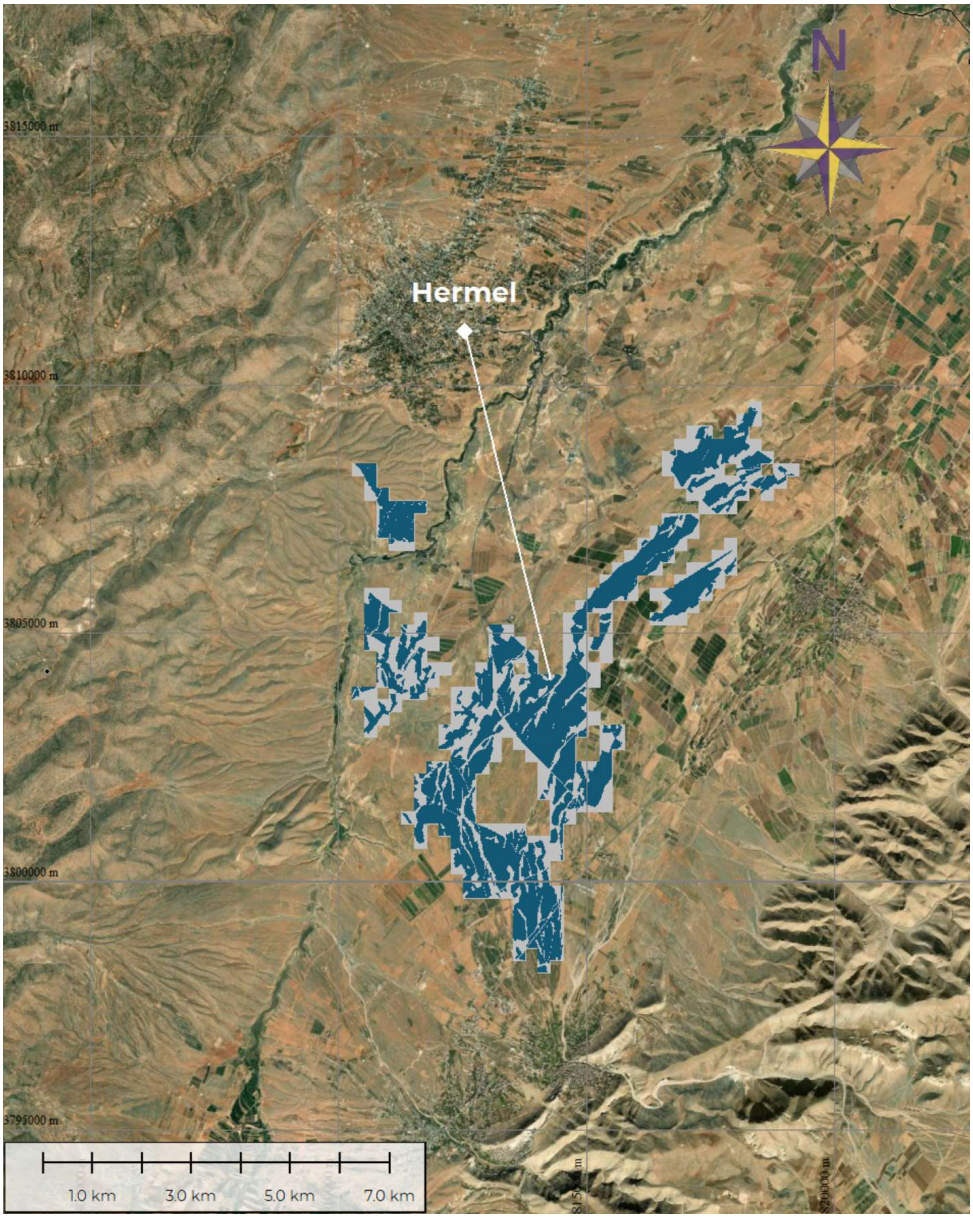


Figure 2: Proposed layout for Site #1 – Hermel, Ras Ballbek and Qaa

3.4.1 Scope of Consultancy Service during Part A - Project Preparation and Tendering Stage (Lump Sum Based Contract):

Task A-1: Review of existing technical, engineering, and other studies. This will be comprised of the following main activities.

a. Obtain all information, data, geospatial studies, etc. from the Client and analyze the requirements.

b. Assess whether any updates may be required considering the existing and planned plans to roll out smart meters by the DSPs.

c. Complement the technical analysis that may be needed to finalize technical definition of the EDL's AMI Center and preparation of technical specifications.

d. Analyze options and confirm selection of system Activities/technologies for the solar PV, including panel technology specification, inverter technical requirements.

Task A-2: Technical definition of the solar Parks. This will include detailed technical definition and engineering specifications for all elements of this Project Activity (after completing necessary technical analyses, site surveys, and other assessments). The following list of requirements are to be included in the detailed technical definition of the Development of Grid-Connected Solar PV Plants (not exhaustive):

a. Carry out detailed geospatial analysis of the identified site taking into account pre-specified set of criteria to be agreed upon with EDL Under this task the Consultant is expected to carry out the following main activities:

b. **Assessment of energy production potential. The solar PV resource of the potential solar PV site area should be based on detailed-resolution model**. The approach to be used should include, but not limited to the following main steps, which may be adjusted by the Consultant in agreement with EDL. The calculation of the gross and net energy based on the typical PV module, inverter and other equipment characteristics is to be advised by the Consultant. The Consultant should also estimate the hourly energy profile under P50 and P90 and hourly capacity factors based on the proposed PV modules performance parameters and capacity. The data should be provided in excel.

c. **Detailed specification of all project Activities including but not limited to: site preparation,** PV module and relate equipment costs, inverters, control house, meteorological forecast hardware, protection and control equipment, electrical network, balance of plant, contingency, and decommissioning and site reclamation at end of project life cycle according to the World bank environment and social requirements.

Task A-3: Preparation of the detailed E&S documents required for the Project Activity 3. The Consultant will:

a. Identify the environmental, social and health & safety risks and impacts which are potentially associated with the construction and operation of the solar PV plant.

b. Prepare a site-specific Environmental and Social Impact Assessment (ESIA) appropriate to the nature and scale of the proposed PV plant. The ESIA shall be concise, focusing on the key risks and impacts of the planned activities, and determining the necessary mitigation measures while applying the risk mitigation hierarchy principles prioritizing the avoidance

and minimization to the extent possible of environmental and social impacts during the different phases of the PV plant life cycle. The ESIA shall comply with the World Bank Environmental and Social Standards relevant to the project, the project Environmental and Social Commitment Plan (ESCP), the Stakeholders Engagement Plan (SEP) and the Labor Management Procedures (LMP).

c. Consult with key stakeholders regarding the overall risks and impacts, proposed mitigation measures and incorporate their feedback and relevant concerns into the PV plant designs as well as the ESIA.

d. Prepare the Terms of Reference for the EPC contractor to develop both a Construction Environmental and Social Management Plan (C-ESMP) and a comprehensive standalone occupational health and safety risk assessment for construction activities. The C-ESMP should be consistent with the relevant World Bank Environmental and Social Standards (ESSs) and the employer's ESIA, covering (i) the detailed design of the PV plant, and (ii) the construction of the PV plant.

e. Develop an Environmental and Social Management Plan, as part of the ESIA. The ESMP should be prepared in a manner where it can be included in the bidding documents with clear description of contractors and operators' roles and responsibilities at each phase of the PV plant development.

f. Develop environmental, social and health and safety sections in the PV plant Operation Manual.

Detailed ESIA Terms of Reference is presented in Annex 1.

g.

Task A-4: **Preparation of procurement documents, implementation schedule, and support during tenders till Award of EPC contracts:** This task will include the following:

a. Preparation of BDs based on functional/preliminary designs for all Project Activities based on the technical definitions covered under Task A-2 and A-3 and drawing upon the current design standards and codes of practice used by the Client, current international standards, environmental and social requirements consistent with the World Bank relevant ESSs, and other applicable conditions.

b. Preparation of the design including all equipment specifications, performance specifications, installation and commissioning schedules covering following tasks: preparation, procurement actions up to award of the contract, contract negotiations, and detailed construction activities up to hand-over after testing and commissioning. The Consultant should also confirm that the overall construction schedule of the project is realistic.

c. Support the Client with organization and implementation of the tender for procurement of EPC for each project Activity, including, but not limited to: (a) publication of BDs; (b) clarifications and addendum (if necessary) to be provided to potential bidders during tendering procurement phase; (c) assist the client in conducting of the pre-bid meeting; (d) evaluation of bids and preparation of bid evaluation report; (e) pre-award meeting with the lowest cost evaluated bidder; and (g) drafting of the Contract for the client approval and addressing of other issues to finalize the Contract.

d. Prepare for the client approval the implementation schedules and prepare the procurement strategy for construction of each of the Project's Activities. The review is required to ensure

that timing of works and activities is synchronized with the schedule for the NCC platforms to ensure the overall Project can be commissioned without delays.

e. Prepare for the client approval Participation in answering queries from the potential bidders, clarifications, correspondences, meetings, reporting, etc.

f. Thorough examination of received bids

g. Participation in bids evaluation process, including both technical and commercial bids

h. Preparation of Final Bids Evaluation Report

i. Assistance to EDL in contract negotiations and contract award

j. Preparation of EPC Contract Document for awarded Contractor

k. EPC Contract Document shall be the outcome of the Stage II.

e. Provide design and functional specifications for all needed equipment and systems.

3.4.2 Scope of Consultancy Service during Part B - EPC Contract Management and Construction Supervision (Time Based Contract):

This part of the assignment is to cover the construction supervision including ensuring EPC contractor's compliance with E&S requirements, contract management, as well as factory testing related to all Activities.

Task B-1: Design Review: This task will include the following:

The Consultant will review and comment on proposed location of equipment and facilities, schedule of installation, review and recommend for the client approval of bill of quantities and final price schedule submitted by the Contractors for each of the Project Activities. The Consultant will review and comment on all design and drawings and technical documents submitted by the Contractor including manufacturers' drawings and material submittals. The review should be carried out in close association with EDL team. During this period, the Consultant will also prepare any spreadsheets required for design and prepare a manual for checking drawings of relevant buildings, equipment**,** foundations. Under this task the Consultant is specifically expected to:

- Review and comment on all aspects of design, standards, and deviations proposed by the Contractor.
- Check and ensure that Contractor provides calculations, drawings and design in accordance with technical specifications in the BDs.
- Review the results of investigations and surveys done by the Contractor.
- Maintain a dialogue with the Contractor's design staff to review and comment on Contractor's design documentation.
- Review final design, submitted by the Contractor, and provide recommendations to EDL regarding its approval.
- Attend design review and progress meetings (as required by the Project Managers at EDL).
- Ensure that environmental and social considerations, consistent with the ESIA, OHS Risk Assessment, C-ESMP and relevant ESSs, are properly reflected in the engineering designs, technical specifications and bill of quantities.

- Update the client on a weekly basis about the progress of this task

Task B-2 - Construction Supervision, Quality Assurance and Inspection

- Review and comment on engineering documents such as: (a) detailed design prepared by the Contractor and final working drawings submitted by manufacturers, (b) equipment specifications; and (c) installation procedures.
- Compare detailed specifications, quality and quantity of major equipment with those specified and required by the technical specifications in the BDs.
- Conduct construction supervision during the period of construction works and monitor construction schedule. and inform the client of any delays
- Monitor construction progress of all Project Activities.
- Prepare a detailed Project Control Program using MS Project (or Primavera P6) to provide charts, curves and detailed reports of critical activities, percentage completion, interface points, etc. for design, procurement, installation, and commissioning.
- Hold regular planning and progress review meetings to monitor the Contractor's work progress. If delays or problems are observed, the Consultant shall issue notifications to EDL.
- Prepare monthly progress report and comprehensive quarterly progress report and send them to EDL no later than 10 days after completion of each quarter.
- Assist EDL with overall quality assurance.
- Monitor construction at sites and manufacturing process in factories and advise EDL on quality assurance issues if necessary.
- Monitor Social and Environmental compliance with the bidding documents and contracts, including Health and Safety procedures at construction sites. Suggest the measures to be taken in order to avoid or mitigate possible safety risks during construction and supervise implementation of such measures.

Task B-3 - Supervision of Contractors' Compliance with E&S Requirements under the Project

- Ensure adherence of the Contractor's performance with the Client's Environmental & Social Impact Assessment (ESIA), E&S Management Plan (ESMP), LMP, SEP, OHS Risk Assessment and the Code of Conduct of Contractors.
- Receive, review, comment upon, and advice the client to approve Contractor's ESMP (C-ESMP).
- Receive, review, comment upon, and advice the client to approve Contractor's OHS Risk Assessment.
- Undertake environmental, social and health and safety monitoring of the Contractor's performance according to the ESMP of the Client, LMP, SEP, C-ESMP and the OHS Risk Assessment.
- Identify any unexpected environmental, social and health & safety issues that had not been covered by ESMP, C-ESMP, LMP,SEP, OHS Risk Assessment, notify Client on them, and work out response measures.
- Identify cases of environmental, social, and health & safety non-compliances, if any, and assess damage done.
- Recommend and agree on the corrective actions with the Client and follow up on their

implementation by the Contractor.

- Ensure that the Contractor establishes and maintains the Grievance Redress Mechanism (GRM) and include respective information in the progress reports.
- .Ensure that the Contractor complies with the project Labor Management Plan (LMP), including provisions on Occupational Health and Safety and Code of Conduct. Report any non-compliance with LMP to the Client and oversee implementation of corrective measures.
- Check contractor's training records pertaining to environmental, social and OHS aspects.
- Promptly report any project-related incidents or accidents to the Client.

Task B-4 - Contract Management

- Review invoices submitted by the Contractor in accordance with price adjustment provisions and advise EDL on approval of those invoices.
- Control project implementation schedules (construction, supply, and budgeting schedule) prepared and submitted by the Contractor.
- Review and advice on remedy action that should be taken by the Contractor, estimate the delays required to make up, and resolve schedule constraints during construction period.
- Assist EDL in resolving disputes and claims raised by the Contractor.
- Rate extra/additional work to be carried out by the Contractor and recommend rates for such work to EDL.
- Describe any variation of project cost and implementation time from the originals and explain causes, effects and countermeasures to EDL.
- Review contract change-order procedures for design, supply and installation contract for the substations, and identify any potential flaws and suggest changes.
- Manage and control all variation order and contract amendment procedures.
- Review and compile as-built drawings and review the operation and maintenance manual provided by the Contractor for accuracy and adequacy.
- Ensure timely preparation and submission of environmental and social reports.
- Advise the Client on environmental, social, and health & safety contractor's non-compliances and proportiante disciplinary measures in accordance with relevant contract clauses.

Task B-5 - Support to EDL related to factory test of materials and equipment, and guarantee testing and commissioning

- Support EDL in all aspects related to the factory tests organized by the Contractor, including but not limited to: inspections and witnessing of acceptance tests during manufacturing (factory test) of materials and equipment to be supplied for the Project.
- Review commissioning plan and program.
- Witness and assist EDL during guarantee testing and commissioning.

- Prepare the Certificate of Construction Completion (CCC) and the Certificate of Operational Acceptance (COA).

3.5 Activity 4 – EDL Grid Reinforcement

e. This Activity provides finance to specific transmission reinforcements, as well as grid connection of the solar PV farms of Activity 3 to EDL grids. This Activity would finance the (a) rehabilitation of Ashrafia 220 kV substation, (b) Rehabilitation of 220 kV Deir Nbouh – Baalbeck overhead transmission line (OHL), (c) Adding two 220KV new bays in Baalback substation and associated control and protection panels and other necessary works at Baalbek substation in order to improve the reliability of the Northern 220 kV loop, and (d) connection of the solar PV plant (described in Activity 3) to EDL grid in line with international best practices.

The scope of the Owner engineer will be as follows:

3.5.1 Scope of Consultancy Service during Part A - Project Preparation and Tendering Stage (Lump Sum Based Contract):

- **Task A-1: Technical definition of the investments under Activity 4.** This will include detailed design with technical definition and cost estimation for the facilities, engineering specifications and drawings for all elements of this Project Activity (after completing necessary technical analyses, site surveys, geotechnical studies, and other assessments) in order to prepare Tender Documents.
- **Task A-2: Preparation of the detailed E&S instrument required for the Project Activity 4.** The Consultant will:
  a. Identify the environmental, social and health & safety risks and impacts which are potentially associated with the grid reinforcement included, inter alia, (i) removal of damaged power lines, tower footings, (ii) design, construction and operation o of new interconnection towers, overhead cables, and substations.

  b. Prepare a site-specific Environmental and Social Management Plan (ESMP) appropriate to the nature and scale of the proposed grid reinforcement activities. The ESMP shall be concise, focusing on the key risks and impacts of the planned activities, and determining the necessary mitigation measures while applying the risk mitigation hierarchy principles prioritizing the avoidance and minimization to the extent possible of environmental and social impacts during the different phases of the life cycle of this Activity 4. The ESMP shall comply with the World Bank Environmental and Social Standards relevant to the project, the project Environmental and Social Commitment Plan (ESCP), the Stakeholders Engagement Plan (SEP) and the Labor Management Procedures (LMP).

  c. Consult with key stakeholders regarding the overall risks and impacts, proposed mitigation measures and incorporate their feedback and relevant concerns into the designs as well as the ESMP.

  d. Prepare the Terms of Reference for the EPC contractor to develop both a Construction Environmental and Social Management Plan (C-ESMP) and a comprehensive standalone occupational health and safety risk assessment. The C-ESMP should be consistent with the relevant World Bank Environmental and Social Standards (ESSs) and the employer's ESMP,

covering: (i) the decommissioning of the damaged towers and overhead power lines, and (ii) the design and construction of the new interconnections. The occupational health and safety risk assessment should address all activities during the removal of damaged tower footings, overhead lines, reinstating new towers and cables, and construction of new substations as part of the grid reinforcement and PV plant power evacuation/interconnection activities.

The ESMP should be prepared in a manner where it can be included in the bidding documents with clear description of contractors and operators' roles and responsibilities at each phase of the sub-Project.

Task A-3: **Preparation of procurement documents, implementation schedule, and support during tenders till Award of EPC contracts:** This task will include the following:

l. Preparation of BDs based on functional/preliminary designs for all Project Activities based on the technical definitions covered under Task A-1 and A-2 and drawing upon the current design standards and codes of practice used by the Client, current international standards, relevant World Bank environmental and social standards, WBG EHS Guidelines for transmission lines and other applicable conditions.

a. Preparation of the design including all equipment specifications, performance specifications, Technical Data Sheet for all the equipment, Bill of Quantities, installation and commissioning schedules covering following tasks: preparation (including definition of evaluation and qualification criteria, and rated criteria), procurement actions up to award of the contract, contract negotiations, and detailed construction activities up to hand-over after testing and commissioning. The Consultant should also confirm that the overall construction schedule of the project is realistic.

b. Support the Client with organization and implementation of the tender for procurement of EPC for each project Activity, including, but not limited to: (a) publication of BDs; (b) responses to clarifications and addendum (if necessary) to be provided to potential bidders during tendering procurement phase; (c) assist the client in conducting of the pre-bid meeting; (d) evaluation of bids and preparation of bid evaluation report for the client; (e) assist the client in conducting the pre-award meeting with the lowest cost evaluated bidder; and (g) drafting of the Contract for the client approval and addressing of other issues to finalize the Contract.

c. Prepare for the client approval the implementation schedules and prepare the procurement strategy for construction of each of the Project's Activities. The review is required to ensure that timing of works and activities is synchronized with the schedule for the NCC platforms to ensure the overall Project can be commissioned without delays.

d. Prepare for the client approval Participation in answering queries from the potential bidders, clarifications, correspondences, meetings, reporting, etc.

e. Thorough examination of received bids

f. Participation in bids evaluation process, including both technical and commercial bids

g. Preparation of Final Bids Evaluation Report

h. Assistance to EDL in contract negotiations and contract award

i. Preparation of EPC Contract Document for awarded Contractor

j. EPC Contract Document shall be the outcome of the Stage II.

3.5.2 Scope of Consultancy Service during Part B - EPC Contract Management and Construction Supervision (Time Based Contract):

This part of the assignment is to cover the construction supervision including ensuring EPC contractor's compliance with E&S requirements, contract management, as well as factory testing related to all Activities.

Task B-1: Design Review: This task will include the following:

The Consultant will review and comment on proposed location of equipment and facilities, schedule of installation, review and recommend for the client approval of bill of quantities and final price schedule submitted by the Contractors for each of the Project Activities. The Consultant will review and comment on all design and drawings and technical documents submitted by the Contractor including manufacturers' drawings and material submittals. The review should be carried out in close association with EDL team. During this period, the Consultant will also prepare any spreadsheets required for design and prepare a manual for checking drawings of relevant buildings, equipment**,** foundations. Under this task the Consultant is specifically expected to:

- Review and comment on all aspects of design, standards, and deviations proposed by the Contractor.
- Check and ensure that Contractor provides calculations, drawings and design in accordance with technical specifications in the BDs and standards.
- Review the results of ground investigations and land surveys done by the Contractor.
- Maintain a dialogue with the Contractor's design staff to review and comment on Contractor's design documentation.
- Ensure that design-related environmental and social mitigation measures are adequately incorporated into the designs, technical specifications, and bill of quantities.
- Review final design, submitted by the Contractor, and provide recommendations to EDL regarding its approval.
- Attend design review and progress meetings (as required by the Project Managers at EDL).
- Update the client on a weekly basis about the progress of this task

Task B-2 - Construction Supervision, Quality Assurance and Inspection

- Review and comment on engineering documents such as: (a) detailed design prepared by the Contractor and final working drawings submitted by manufacturers, (b) equipment specifications; and (c) installation procedures.
- Compare detailed specifications, quality and quantity of major equipment with those specified and required by the technical specifications in the BDs.
- Conduct construction supervision during the period of construction works and monitor construction schedule. and inform the client of any delays
- Monitor construction progress of all Project Activities in line with approved project schedules.
- Prepare a detailed Project Control Program using MS Project (or Primavera P6) to provide charts, curves and detailed reports of critical activities, percentage completion, interface points, etc. for design, procurement, installation, and commissioning.

- Hold weekly planning and progress review meetings to monitor the Contractor's work progress. If delays or problems are observed, the Consultant shall issue notifications to EDL.
- Prepare monthly progress report and comprehensive quarterly progress report and send them to EDL no later than 10 days after completion of each quarter.
- Assist EDL with overall quality assurance.
- Monitor construction at sites and manufacturing process in factories and advise EDL on quality assurance issues if necessary.
- Monitor Social and Environmental compliance with the bidding documents and contracts, including Health and Safety procedures at construction sites. Suggest the measures to be taken in order to avoid or mitigate possible safety risks during construction and supervise implementation of such measures.

Task B-3 - Supervision of Contractors' Compliance with E&S Requirements under the Project

- Ensure adherence of the Contractor's performance with the Client's Environmental & Social Management Plan (ESMP), LMP, SEP and the Code of Conduct of Contractors.
- Receive, review, comment upon, and advice the client to approve Contractor's ESMP (C-ESMP).
- Receive, review, comment upon, and advice the client to approve Contractor's OHS Risk Assessment.
- Undertake environmental and social monitoring of the Contractor's performance according to the ESMP of the Client, LMP, SEP, C-ESMP and the OHS Risk Assessment.
- Identify any unexpected environmental, social and health & safety issues that had not been covered by ESMP, C-ESMP, LMP, SEP, OHS Risk Assessment, notify Client on them, and work out response measures.
- Identify cases of environmental, social, and health & safety non-compliances, if any, and assess damage done.
- Recommend and agree on the corrective actions with the Client and follow up on their implementation by the Contractor.
- Ensure that the Contractor establishes and maintains the Grievance Redress Mechanism (GRM) and include respective information in the progress reports.
- Ensure that the Contractor complies with the project Labor Management Plan (LMP), including provisions on Occupational Health and Safety and Code of Conduct. Report any non-compliance with LMP to the Client and oversee implementation of corrective measures.
- Check contractor's training records pertaining to environmental, social and OHS aspects.
- Promptly report any project-related incidents to the Client.

Task B-4 - Contract Management

- Review invoices submitted by the Contractor in accordance with price adjustment provisions and advise EDL on approval of those invoices.
- Control project implementation schedules (construction, supply, and budgeting schedule) prepared and submitted by the Contractor.

- Review and advice on remedy action that should be taken by the Contractor, estimate the delays required to make up, and resolve schedule constraints during construction period.
- Assist EDL in resolving disputes and claims raised by the Contractor.
- Rate extra/additional work to be carried out by the Contractor and recommend rates for such work to EDL.
- Describe and evaluate any variation of project cost and implementation time from the originals and explain causes, effects and countermeasures to EDL.
- Review contract change-order procedures for design, supply and installation contract for the substations, and identify any potential flaws and suggest changes.
- Manage and control all variation order and contract amendment procedures.
- Review and compile as-built drawings and review the operation and maintenance manual provided by the Contractor for accuracy and adequacy.
- Ensure timely preparation and submission of environmental and social reports.
- Advise the Client on environmental, social, and health & safety contractor's non-compliances and proportiante disciplinary measures in accordance with relevant contract clauses.

Task B-5 - Support to EDL related to factory test of materials and equipment, and guarantee testing and commissioning

- Support EDL in all aspects related to the factory tests organized by the Contractor (including but not limited to, high voltage transformers, switchgear, protection and control panels) including but not limited to: inspections and witnessing of acceptance tests during manufacturing (factory test) of materials and equipment to be supplied for the Project.
- Review commissioning plan and program.
- Witness and assist EDL during guarantee testing and commissioning.
- Prepare the Certificate of Construction Completion (CCC) and the Certificate of Operational Acceptance (COA).

4 Qualifications and Experience of Key Staff

The Consultant's team should have the following Key Staff that should meet the specified requirements related to qualifications and experience. For all key staff, Excellent knowledge of English language is a must (oral, writing, reading), and knowledge of Arabic is preferred. The consultant may combine one or more of the key staff among different project Activities but has to show that the productivity and efficiency will increase by doing so. All key staff must spend at least 60% of the time in the field for effective implementation and supervision throughout all project life cycle phases.

Key Staff	Qualification and Experience Requirements
Activity 1	
Team leader/SCADA EMS	• At least M.Sc. Degree in electrical engineering or other relevant field. • 10 years' experience in project management and design of SCADA/EMS systems. The Engineer should have previous experience in procurement, engineering, business administration; knowledge of international organizations/agencies; previous work experience in projects financed by international financial organization. The Engineer will manage the Consultant's team as team leader and be the SCADA/EMS Engineer at the same time. Previous experience in developing countries in the region is preferable.
Senior Telecommunication Engineer	• At least M.Sc. Degree in electrical engineering or other relevant field. • Minimum 10 years of experience in telecommunications engineering, with a focus on large-scale projects such as control centers, SCADA systems, or utility communications networks. In-depth understanding of preparing detailed technical specifications and tender package and site supervision of telecom projects for electric utility, including fiber optics, microwave communications, radio communications, and satellite communications. • Proficiency in designing and integrating telecom networks, including IP networks, MPLS, and SDH/SONET. • Proven track record of designing and supervising the implementation of telecom projects as per industry standards and protocols such as IEC 61850, IEEE standards, ITU-T recommendations, and NERC CIP requirements. • Understanding of cybersecurity practices and standards for telecom networks, including encryption, firewall configurations, and intrusion detection/prevention systems.
Transmission Line (OPGW) Engineer:	• At least M.Sc. Degree in electrical engineering or other relevant field.

	• 5 years of relevant experience in design of transmission lines. Previous experience in developing countries in the region is preferable.
Senior Civil/Architectural Engineer:	• At least M.Sc. Degree in civil engineering or other relevant field. • 10 years of relevant experience in power transmission projects. The specific experience of Control Centre Buildings is required, with emphasis on Control Room design. Previous experience in developing countries in the region is preferable. • This key staff will be in charge of all aspects of the civil/architectural/MEP of the new NCC building during design and construction stages. This key staff will need to be supported by other subject matter experts on various aspects of establishing the building and balance of plant.
Senior Electrical Substations Engineer:	• At least Bachelor's Degree in electrical engineering or another related field. • At least 15 years of relevant experience with SCADA systems; prior experience with design and application of RTU and rehabilitation works. Previous experience in developing countries in the region is preferable.
Activity 2	
Task Leader	• At least Master's degree in relevant engineering field. At least 15 years of international experience in power sector, including at least 5 years as project manager. Experience in designing, appraising smart grid projects including understanding of smart grid technologies and Advanced Metering Infrastructure projects. Experience in actual execution of smart grid projects with transmission and distribution utilities. Excellent knowledge of English language. Knowledge of Arabic or French preferred.
• Distribution commercial systems expert	• At least Master's degree in relevant engineering field. At least 15 years of international experience in designing and providing implementation support for implementing CMS/CIS systems for power distribution utilities. Excellent knowledge of English language. Knowledge of Arabic or French preferred.
• AMI expert	• At least Master's degree in relevant engineering field. At least 15 years of experience in smart grid technologies/standards/guidelines and their integration into power transmission and distribution networks, including AMI, IT/OT, Related infrastructure (energy accounting systems, MDMs, etc.). Proven experience in establishing technical

Activity 3	
Team Lead Senior Solar Power Plant Engineer:	• At least M.Sc. Degree in electrical engineering or other relevant field. • 10 years of relevant experience in large scale utility connected solar PV projects, including design, specification, tender preparation, construction, constriction supervision, commissioning, testing, and project management. Previous experience in developing countries in the region is preferable.
Senior Electrical Substations Engineer:	• At least Bachelor's Degree in electrical engineering or another related field. • At least 15 years of relevant experience with SCADA systems; prior experience with design and application of substations and connection of solar PV projects to transmission network. Previous experience in developing countries in the region is preferable.
Activity 4	
Task Leader	• The Task Leader should be an electrical or civil engineer (MSc or BSc supported by relevant qualification certification) and should have a minimum 15 years experience in planning, managing and supervising works related EHV, of 220 kV or higher transmission voltages. The Task Leader should present evidence as having managed and coordinated successfully at least 5 (five) projects of a similar nature as international EPC or Turnkey contracts funded by international development financing institutions. • The Project Manager should be an individual with good communication skills in the English language, both written and verbal and a high sense of organization and responsibility. • The Project Manager should have experience in similar project coordination in developing countries, preferably in African countries. He shall execute overseeing responsibilities and may be in charge of one of the technical subjects. • During the site construction works, it is envisaged that the Project Manager will be present on site for at least 70% of the relevant construction period. During his absence he shall be deputized.
Senior Substation Engineer	• The Lead Substation Engineer should be a professional electrical engineer, MSc or BSc, with relevant working experience of not less than 10 years in planning, designing, managing and supervising substation works and related facilities of 220 kV or higher. • The person shall have experience in similar project work in

	developing countries, preferably in the region.
Senior Transmission Line Engineer	• The Lead Transmission Line Engineer should be a professional civil or electrical engineer, MSc or BSc, with relevant working experience of not less than 10 years in planning, designing, managing and supervising works on transmission lines and related facilities of 220 kV or higher. • • The person shall have experience in similar project work in developing countries, preferably in the region.
Control/Protection/Communication Specialist	• The Control/Protection/Communication Specialist should be professional electrical or telecom engineer, MSc or BSc, with relevant experience and possess professional experience of not less than 10 years in planning, designing, testing, managing, supervising and commissioning works related to telecommunication, SCADA and integration works, protection, as the case may be, on the level of 132kV to 400kV substations and transmission networks.
Structural/Civil Engineer	• The Structural/Civil Engineer should be a professional engineer, MSc or BSc, with at least 10 years relevant experience covering steel structure design, quality control, full scale structure testing, design of tower foundations and electrical apparatus foundations, and other civil works related to substations. The candidates shall be able to use PLS Tower design software. The positions of structural/civil engineer may be combined with that of Senior transmission line engineer, provided that the candidate's experience adequately covers the requirements of these Terms of Reference.
Shared Key Staff	
Project Director	• At least M.Sc. Degree in engineering, or another related field. • At least 15 years of relevant international experience in managing multi-disciplined owner engineering teams for projects involving NCCs, Telecom, AMI, Substations, Solar PV projects. Including project preparation, tender package documents, tender evaluation, supervise construction, • During the site construction works, it is envisaged that the Project Director will be present on site for at least 70% of the relevant construction period. During his absence he shall be deputized.
Procurement and Contract Specialist	• At least Bachelor's Degree in engineering, business, economics or another related field. • At least 10 years of relevant international experience in preparation of bidding documents for transmission utility projects of similar scope.
	•

	•
Contract Management Specialist	• The Contract Specialist should preferably be a professional engineer, lawyer, or procurement specialist and possess experience of not less than 7 years in procurement and managing international turn-key contracts in the power sector. The specialist shall have a good understanding of World Bank standard bidding procedures and documents and be familiar with FIDIC regulations and the various types of standard bidding documents offered by the other Funding Agencies.

Key Staff	**Qualification and Experience Requirements**
Environmental, Social, Health & Safety – All activities	
Environmental Specialist	• At least Bachelor's degree or equivalent in environmental science, environmental engineering, environmental planning, and/or another relevant disciplines. • At least 15 years of experience of successful preparation and implementation of assessments, management plans for utility projects financed by IFIS. Strong working knowledge in Env and Social standards of international financial institutions is also required. • Documented experience in preparation of environmental instruments for transmission utility projects of similar scope
Social Specialist	• At least Bachelor's degree or equivalent in social science and/or another relevant disciplines. • At least 15 years of demonstrated experience in implementation of social standards preferably by IFIs, including preparation and implementation of environmental & social impact assessment and management plans, livelihood restoration and resettlement plans, community health and safety, gender and GBV issues, , etc., . • •
Occupational Health & Safety Specialist	• Must be internationally acknowledged OHS certified specialists • At least 15 years of experience of successful preparation and implementation of OHS systems, OHS plans, risk assessments, OHS training, and accident investigations applying root cause analysis (RCA) techniques and approaches.. • Strong familiarity with local and international safety standards, including electrical safety, fall protection, and environmental regulations.

	• Strong ability to assess and mitigate hazards related to electrical systems, falls, machinery, and hazardous materials. • Competency in handling hazards, implementing lockout/tagout (LOTO) systems, and managing fire safety on-site. • Strong OHS leadership and training skills. • Ability to lead emergency response plans, provide first aid, and deliver safety training and toolbox talks. • Strong communication skills with all work levels.
Biodiversity specialist (***specific to Activities 3 and 4***)	• A bachelor's or master's degree in biology, ecology, environmental science, or a related field. Advanced degrees may be preferred for higher-level positions. • 10 years of hands-on field experience with practical experience in conducting biodiversity assessments, field surveys, and ecological research applying proven methodologies and tools used in biodiversity studies (e.g. IBAT) • Strong familiarity with local, national, and international environmental regulations and policies related to biodiversity conservation and management. • Proficiency in using Geographic Information Systems (GIS), statistical software, and other relevant tools for data analysis and mapping. Knowledge of species identification and habitat assessment techniques is also important. • Strong written and verbal communication skills for preparing reports, presenting findings, and collaborating with clients, stakeholders, and team members.
Tangible and intangible cultural heritage expert	• A bachelor's or master's degree in archeology, cultural heritage management, or a related field. • At least 5 years experience in conducting archaeological surveys to identify and document archaeological sites, including mapping, recording site locations, and assessing their significance. • Previous experience in performing assessments of cultural heritage sites to evaluate their condition, significance, and potential impacts from development or other activities, using both non-invasive and invasive methods. • Experience in preparing Cultural Resource Management Plans (CRMP) conducting impact assessments, and ensuring compliance with heritage protection regulations • Strong written and verbal communication skills for preparing reports, presenting findings, and collaborating with clients, stakeholders, and team members.

5 Reporting, Deliverables and Deadlines

The Consultant is expected to present reports, elaborate and submit deliverables as required. In addition, project deliverables are also covered in this section.

The reporting schedule stated below reveals the reporting obligations. The reports prepared by the Consultant shall comply in content and form with the requirements to allow Employer to comment and forward them to the financiers to satisfy their obligations.

The WB may require special reporting formats, which will be discussed during the Kick-off meeting.

In addition to the progress reporting stated above, the Consultant shall report on all circumstances that might jeopardize the achievement of the overall objective, the Project purpose, and the results. In particular, the Consultant shall notify Employer and the financiers promptly of any event concerning environmental and social issues as well as on adjacent populations:

That has direct or potential material adverse effects

That has attracted substantial adverse attention of outside parties, created substantial adverse press reports or

Gives rise to material potential liabilities.

The Consultant shall also inform Employer of any measures taken to mitigate or remedy the effects or cause of such events.

The Consultant will prepare the following reports and documents during the execution of the different phases of the project. During the Kick-off meeting, details of the reporting format shall be discussed and determined.

5.1 Deliverables during Part A - Project Preparation and Tendering Stage (Lump Sum Based Contract):

For each of the four Project activities, under the lump-sum part of the assignment (the Part A), the deadlines for reports and deliverable are the following.

Deliverables	Deadline
Inception Report	Contract signing + 20 calendar days
Detailed Technical Definition of the Component, including respective cost estimates and all necessary study reports	Contract signing + 70 calendar days
Design Package for Client Review	Contract signing + 90 calendar days
Draft tender documents	Contract signing + 110 calendar days
Final Tender Documents for construction of works, and a Project Activity Implementation Manual	Contract signing + 150 calendar days
Tender Launching with a fixed bidding period of 45 days minimum	Contract signing + 155 calendar days
Bid Evaluation Report for EPC proposals	Contract signing + 230 calendar days
Contract Documents for entire project composed in project packages as proposed by the Consultant	Contract signing + 280 calendar days

Draft E&S instruments for Activities 1, & 4 for Client and WB review	Contract signing + 60 calendar days
Final E&S instruments for Activities 1, & 4 for Client acceptance and WB clearance	Contract signing + 90 calendar days
Draft E&S instruments for Activity 3 for Client and WB review	Contract signing + 90 calendar days
Final E&S instruments for Activity 3 for Client acceptance and WB clearance	Contract signing + 120 calendar days

5.2 Deliverables during Part B - EPC Contract Management and Construction Supervision (Time Based Contract):

For each of the four Project activities, under the time-based part of the assignment (the Part B), the requirements are the following. The Consultant shall prepare various reports/documents at the time and with pertinent number of copies for printed versions as indicated below and shall deliver them to the Client. The Consultant will prepare all reports in the English language.

Report/Document	Number of copies	Deliverable
Detailed (master) Implementation Schedule	2 hard copies in English, duly signed by the Project Director, and electronic version (in PDF and workable format) to the Client.	The Consultant is responsible for the preparation and continuously updating a detailed (master) implementation schedule for each of the project's activities using a commercially accepted project scheduling software.
Monthly Report	2 hard copies in English, duly signed by the Project Director, and electronic version (in PDF and workable format) to the Client.	Every month after the effective date of the Contract, within 10 working days from the end of the month.
Quarterly Report	2 hard copies in English duly signed by the Project Director, and electronic version (in PDF and workable format) to the Client.	Every three months after the effective date of the contract, within 15 working days from the end of each quarter. Georgian version, in 30 days from the end of each quarter.
Final Project Report	3 hard copies in English accompanied by Georgian translation, duly signed by the Team Leader, 3 (three) CD ROMs and electronic version (in PDF and workable format) to the Client.	4 weeks after the completion of the Project.
Factory Acceptance Testing Reports (prepared	2 hard copies in English and electronic version (in PDF format)	Within 2 weeks of test

Report/Document	Number of copies	Deliverable
by the related contractor/manufacturer)	to the Client.	
Minutes of Monthly Progress Meetings	Scanned copy of the Minutes in English signed by the parties to the Client.	Within 5 working days from each progress meeting
Minutes of Weekly Site Meeting	Scanned copy of the Minutes in English, signed by the parties to Client.	Within 5 working days from each Site meeting
Incident/Accident Reports	2 hard copies in English, duly signed by the Project Director, and electronic version (in PDF and workable format) to the Client.	• Regular with monthly and quarterly reports. • Immediate (24 hours from occurrence of a severe incident/accident)

2. For each project Activity, the detailed contents of the reports on the status of project implementation will be discussed and agreed with the Client. It is proposed that monthly reports cover the following.

Monthly Reports:

- Description of works performed during the reporting period (contractors' monthly progress reports).
- Activities planned for the next month (contractors' monthly progress reports).
- Regularity of meetings between Consultant, contractor and the Client key staff to discuss pending issues; the report shall include a copy of Minutes of Progress Meetings.
- Actual status of deliveries/works in percentages.
- Actual status of implementation of the Client's ESMP and C-ESMP.
- Status of compliance with the Code of Conduct and the Labor Management Procedure.
- Status of Stakeholder Engagement Plan (SEP) implementation.
- Record of onsite occupational accidents and near-miss incidents.
- Records of grievances from workers and communities.
- Identification of problematic areas.
- Any deviations from required and referenced plans and procedures, as well as respective remedial actions recommended by the Consultant and the Client; description of application of previously recommended remedial actions by the Contractor (how they were applied, what results they had).

Quarterly Reports:

- Summary of main issues and obstacles, including recommended corrective action.
- Project Description including time schedule and project value.

- Progress and activities of the Contractor.
- Progress of manufacturing.
- Progress of deliveries.
- Progress of construction versus original schedule.
- Actual status of deliveries/works in percentages.
- Planned activities for the next reporting period.
- Changes in the scope of the Project and scope of services, including the list of issued change orders, if any.
- Contractor's site office activities and works accomplished.
- List of invoices issued by the Contractor and their status.
- Progress of contractors' design, preparation of drawings, calculations and documents received by the Consultant and their status of approval.
- Actual status of implementation of the Client's ESMP and C-ESMP.
- In quarterly perspective: status of grievance resolution (as per agreed grievance log).
- In quarterly perspective: status of compliance with the Code of Conduct and the Labor Management Procedure.
- Record of onsite occupational accidents and near-miss incidents.
- Record of stakeholder engagement activities, grievances from workers and communities.
- Status of physical disbursements of payment to the Contractor.
- Annexes (plans, schedules, progress photographs).

3. All quarterly reports shall include the status of Project performance against the results indicators to be specified by the Client.

<u>Final Project Reports:</u>

- Executive Summary
- Project description comprising:
  - Objectives
  - Activities of Project and scope with the name and address of individual contractor/sub-contractor
  - Implementation method
  - Project history
  - Changes in scope-change orders issues
- Project execution comprising:
  - Comparison of planned and actual time-schedules
  - Comparison of planned and actual costs
  - Discrepancies in procurement of material and equipment

- Findings during construction
- Justification and explanation of changes in time-schedule
- Justification and explanation of changes in Project costs
- Performance of Contractors, including environmental, social, health & safety compliance
- Additional works performed
- Experience with shut-down procedures
- Test protocols/test results
- Taking over certificates
- Overall environmental and social performance of the Project: assessment of adherence of Contractor(s) to the ESMP, LMP, SEP, C-ESMP and the Code of Conduct, main challenges faced, main types of remedial actions undertaken, analysis of residual environmental and social factors and respective aspects to be monitored during commissioning of the facilities, post construction activities, and contractor demobilization E&S activities.
- Record of occurrences of occupational health and safety accidents/incidents
- Record of stakeholder engagement activities, grievances from workers and communities.
- Experience gained during project implementation
- Illustrations with photographs
- Final Training Report.

The Final Project Report shall include the Project performance against the parameters as set out in the Results Framework to be specified by the Client, including baseline data and benchmarks, to monitor progress. The final content will be defined in agreement with the Client.

6 Roles Of The Employer

The Employer shall have the following obligations:

- Provide reports of all relevant studies and reports for all project activities.
- Provide support letters to the Consultant for their engagements with stake holders when necessary.
- Relevant EDL staff to be available to work with the Consultant when required.
- Participate in the evaluation of proposals
- Participate in review reports submitted by the Consultant
- Participate in Factory Acceptance Tests and Site Acceptance Tests

7 Project Implementation Unit (PIU)

EDL will be the Project Executing Agency. EDL will assign its own Project Implementation Unit (PIU) to

supervise and coordinate the implementation of the Project. The PIU shall be composed of a Senior Project Manager in charge. Other staff may be resourced from the corporate structure. The PIU will be composed of at least five (5) full-time staff and supporting staff delegated to the PIU as required covering all disciplines to help with smooth management of the project. Professional staff seconded to the PIU shall be on the payroll of EDL to ensure capacity building aspects. On site, local Transmission/Site/Civil/Telecom/SCADA/Protection and Control Engineers and Clerk of Works shall act as counterpart staff to the Consultant during the project implementation as decided during the Kick-Off meeting or at a later stage. The Consultant will support the PIU. The consultant shall report to the PIU Senior Manager and this shall be confirmed during the inception meeting.

For reasons of ownership, the specific tasks of the PIU Senior Manager with support from the Consultant, will essentially address the following tasks:

- Invite bidders for the project and evaluate offers as per Rules and Guidelines for WB;
- negotiate contract with the selected firm;
- monitor the progress of implementation and review reports submitted by the consultant;
- control the disbursement of the project funds;
- submit reports to relevant departments and the Fund for comment;
- liaise between the Consultant and the relevant Parties;
- discuss with Authorities, Stakeholders, etc.
- Report to WB as required by the Rules and Guidelines for Procurement under WB finance cooperation.

Liaison and Documents:

The PIU Senior Manager shall serve as a liaison between the Consultant, the various agencies and Government departments associated with or interested in the project. The Consultant shall be given unhindered access to the relevant agencies and territories to carry out the assignment. The Consultant shall, however, be fully responsible for collecting data and information from these agencies after paying the necessary charges. EDL shall provide the Consultant with copies of all data, including reports on previous studies, including the relevant environmental and social studies, and any other type of reports as or if available, which it considers relevant for the execution of the Consultant's work.

Annex I: Terms of Reference for preparation of Environmental and Social Impact Assessment (ESIA) for the Construction and Operation of a Solar Power Plant

1. Introduction

This Terms of Reference (ToR) outlines the requirements for conducting an Environmental and Social Impact Assessment (ESIA) for the construction and operation of a solar power plant. The ESIA will be conducted in accordance with the World Bank's Environmental and Social Standard 1 (ESS1) requirements and the Project Environmental and Social Commitment Plan (ESCP)[4].

2. Objectives

The main objectives of the ESIA are to:

- identify and assess the potential environmental and social impacts of the solar power plant project.
- review the planning for site selection and technical designs with the purpose of determining mitigation measures to avoid and minimize adverse impacts following the mitigation hierarchy.
- ensure compliance with national legislation and the World Bank's Environmental and Social Framework (ESF).
- engage stakeholders and address their concerns through a comprehensive Stakeholder Engagement Plan (SEP).

3. Scope of Work

The ESIA will cover the following key areas:

3.1 Project Description

- Detailed description of the solar power plant, including location, design, capacity, and technology.
- Description of associated facilities and infrastructure.

3.2 Legal and Institutional Framework

The Consultant shall perform the following tasks:

- Review of relevant national legislation pertaining to environmental protection, environmental assessment and management; labor legal rights, health and safety requirements, land acquisition, stakeholder engagement and social development goals which are applicable to the project activities and determine the specific requirements to abide with by the construction contractors and plant operator.
- Review and determine the contractor and plant operator's binding World Bank requirements in accordance with:

[4] Link to disclosed ESCP

- Environments and Social Framework, “ESF”, 2018. Relevant ESSs have been determined to be: ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, ESS10
- World Bank Group (WBG) General Environmental, Health and Safety Guidelines (“WBG EHS General Guidelines[5] ”), and the EHS Guidelines for Electric Power Transmission and Distribution, and other relevant Good International Industry Practice (GIIP} Good Practice Notes of the World Bank Group.
- Public consultation, stakeholder engagement and information disclosure in accordance with ESS10
- Access to information policy.

- Determine the specific requirements of the relevant international conventions and protocols applicable to the project activities.

The Consultant shall assess any discrepancies between national requirements and World Bank standards, propose measures to address these discrepancies, and clearly delineate the legal requirements and emission levels to be adhered to, prioritizing the more stringent standards.

3.3 Baseline Conditions

- Collection of site-specific baseline data on environmental and social conditions in the project area.
- Assessment of current land use, land ownership and land access, biodiversity, water resources, air quality, security and socio-economic conditions, including employment, gender, poverty, vulnerable groups and access to information.
- Conduct a thorough biodiversity survey, in the appropriate season, to identify populations or specimens of endemic flora, fauna and avifauna species that may be present and affected by the Solar PV power plant development in reference to the environmental screening report[6] prepared by EDL.
- Determine if any part of the solar plant development will be located within the Semi-Desert Area of Ras Baalbek Important Bird Area (IBA).
- Conduct surface survey of locations proposed for solar power plant development for evidence of cultural heritage.

3.4 Impact Assessment

- Identification and assessment of potential environmental impacts, including:
  - Soil, water, and air pollution.

[5] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines
[6] Link to the E&S Screening Report

- Generation and management of hazardous and non-hazardous waste.
- Resource use and efficiency (water and energy).
- Greenhouse Gas (GHG) emissions.
- Biodiversity impacts (terrestrial and avifauna impacts)

- Identification and assessment of potential social impacts, including:
  - Labor risks (hazardous work, child labor, forced labor, terms and conditions of employment, discrimination, occupational health and safety).
  - Community health and safety, including the risks of engaging security personnel to safeguard project workers, sites and assets,
  - Impacts on vulnerable groups.
  - Risks of gender-based violence (GBV), sexual exploitation and abuse (SEA), and sexual harassment (SH).
  - Land use, land ownership, access to land and livelihoods impacts
  - Tangible and intangible cultural heritage.
  - Stakeholder engagement and access to project information

3.5 Environmental & Social Management Plan

The Consultant shall develop an ESMP which focuses on the set of mitigation, monitoring, reporting and institutional measures to be taken during construction and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. Therefore, the ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the ESIA report and the mitigation measures described in the ESMP.

3.5.1 Mitigation Measures

For all proposed mitigation measures, ensure that they follow the risk mitigation hierarch starting from the planning and site selection phase, technical designs, technical specifications...etc. The Consultant shall conduct the following:

- Develop an Environmental and Social Management Plan (ESMP) with specific mitigation measures for identified impacts specific to the context of the PV plant and interconnections.
- Determine the necessary measures to promote adherence to good construction practices and use of special mitigation techniques to avoid pollution and excessive resource use as required by the World Bank ESS3 and World Bank Group General Environmental, Health and Safety (EHS) Guidelines.
- If the biodiversity surveys under 3.2 above determines that (i) habitat within the proposed site is of significant importance to one or more endemic species, or to one or more Endangered or Critically Endangered species, as listed in the IUCN Red List or Lebanon's Red Book, (ii) will have

an adverse effect on the IBA, then prepare a Biodiversity Management Plan (BMP) in line with the requirements of paragraphs 24 through 27 of the World Bank ESS6.

- If the surveys under 3.2 above determines that cultural heritage may be encountered during ground-disturbing activities, develop and implement a Cultural Heritage Management Plan (CHMP) that is consistent with the requirements of the World Bank ESS8.

3.5.2 Environmental and Social Monitoring

The consultant will develop an environmental and social monitoring plan during construction and operation of the PV plant to provide information about key environmental aspects of the project, particularly the environmental and social impacts of the project and the effectiveness of mitigation measures. Specifically, the monitoring section of the ESMP should provide (i) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (ii) monitoring and reporting procedures to (a) ensure early detection of conditions that necessitate particular mitigation measures, and (b) furnish information on the progress and results of mitigation.

3.5.3 Capacity Development and Training

To support timely and effective implementation of the mitigation measures, the ESMP should assess the existing institutional capacity of the Client to ensure the implementation of the ESIA recommendations. The ESMP provides a specific description of institutional arrangements--who is responsible for carrying out the mitigatory and monitoring measures (e.g., for construction, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). Similarly the ESMP should recommend specific actions needed to strengthen environmental and social management capability in the agencies responsible for operation of the PV. The capacity development program may cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

3.5.4 Implementation Schedule and Cost Estimates

For all above aspects (mitigation, monitoring, and capacity development), the ESMP should provide (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures should be integrated into the total project cost tables.

3.6 Stakeholder Engagement and Grievance Mechanism

The Consultant shall engage stakeholders and consult with project-affected people including vulnerable groups to inform the ESIA development. Consultations will be documented in ESIA report. The Consultant will disseminate the EDL project level Grievance Redress Mechanism (GRM) for addressing complaints and concerns.

4. Methodology

The Consultant will develop and prepare the ESIA using the following methodologies:

- **Literature Review:** Review of existing documents, reports, and data relevant to the project. This should include the following key documents: Environmental and Social PV Screening Report, Environmental and Social Commitment Plan (ESCP), Stakeholder Engagement Plan (SEP), World Bank Environmental and Social Framework (ESF), World Bank Group Environmental, Health and Safety General Guidelines (WBG EHSG), EHS Guidelines for Electric Power Transmission and Distribution, and other relevant Good International Industry Practice (GIIP} Good Practice Notes of the World Bank Group
- **Field Surveys:** Conducting field surveys to collect primary data on environmental and social conditions.
- **Stakeholder Consultations:** Engaging with stakeholders through meetings, interviews, surveys, and public consultations.
- **Impact Assessment:** Using qualitative and quantitative methods to assess the potential impacts of the project. Feedback from consultations with stakeholders should be factored into the assessment of potential impacts.
- **Mitigation Planning:** Developing mitigation measures based on the impact assessment findings following the risk mitigation hierarchy as per the World Bank ESS 1 and other relevant ESSs.

5. Deliverables

The consultant will deliver the following reports:

- **Draft ESIA Report:** Detailed assessment of impacts and proposed mitigation measures.
- **Final ESIA Report:** Incorporating feedback from stakeholders and the client.
- **Environmental and Social Management Plan (ESMP) as part of the ESIA:** Detailed plan for implementing mitigation measures. As part of the ESMP, the Consultant shall identify and propose the institutional responsibilities, and the human and financial resources required to ensure proper implementation of the environmental and social management requirements during construction and operation.

6. Timeline

Draft E&S instruments for Activities 1, & 4 for Client and WB review	Contract signing + 60 calendar days
Final E&S instruments for Activities 1, & 4 for Client acceptance and WB clearance	Contract signing + 90 calendar days
Draft E&S instruments for Activity 3 for Client and WB review	Contract signing + 90 calendar days
Final E&S instruments for Activity 3 for Client acceptance and WB clearance	Contract signing + 120 calendar days

7. Reporting and Coordination

The consultant will report to the senior manager of the Project Implementation Unit and coordinate with relevant stakeholders, including relevant government agencies, and local communities.

Annex II: Terms of Reference - Development of Labor Management Procedures (LMP)

This Terms of Reference (ToR) outlines the requirements for preparing Labor Management Procedures (LMP) for the Project - Activities 1 – 4. . The LMP will be prepared in accordance with the World Bank's Environmental and Social Standard 2 (ESS2):Labor and Working Conditions requirements and the Project Environmental and Social Commitment Plan (ESCP).

Scope of Work

The Consultant will develop a Labor Management Procedure for the Project based on the analysis of national law, and gaps between national law and ESS2:Labor and Working Conditions, addressing relevant ESS2 requirements, and in close coordination with the Implementing Agencies. The LMP will apply to all project workers: direct workers, contracted workers and primary supply chain workers. The Consultant shall prepare Project level LMP following the World Bank LMP template. The LMP will cover the following key areas:

1. Overview of labor use in the project.
    - This section describes the following, based on available information:
    - Number of Project Workers: The total number of workers to be employed on the project, and the different types of workers: direct workers, contracted workers and primary supply chain workers. Where numbers are not yet firm, an estimate should be provided.
    - Characteristics of Project Workers
    - Timing of Labor Requirements: The timing and sequencing of labor requirements in terms of numbers, locations, types of jobs and skills required.
    - Contracted Workers: The anticipated or known contracting structure for the project, with numbers and types of contractors/subcontractors and the likely number of project workers to be employed or engaged by each contractor/subcontractor. If it is likely that project workers will be engaged through brokers, intermediaries or agents, this should be noted together with an estimate how many workers are expected to be recruited in this way.
    - Migrant Workers: If it is likely that migrant workers (either domestic or international) are expected to work on the project, this should be noted and details provided.
2. Assessment of key potential labor risks.
    - Project activities: The type and location of the project, and the different activities the project workers will carry out.
    - Key Labor Risks: The key labor risks which may be associated with the project (see, for example, those identified in ESS2 and the GN). These could include, for example:
    - The conduct of hazardous work, such as working at heights or in confined spaces, use of heavy machinery, or use of hazardous materials

- Likely incidents of child labor or forced labor, with reference to the sector or locality
- Likely presence of migrants or seasonal workers
- Risks of labor influx or gender based violence
- Possible accidents or emergencies, with reference to the sector or locality
- General understanding and implementation of occupational health and safety requirements

3. Brief overview of labor legislation: terms and conditions.
4. Brief overview of labor legislation: occupational health and safety (OHS).
5. Responsible staff.
    - This section identifies the functions and/or individuals within the project responsible for (as relevant):
    - engagement and management of project workers
    - engagement and management of contractors/subcontractors
    - occupational health and safety (OHS)
    - training of workers
    - addressing worker grievances
    - This section will identify functions and/or individuals from contractors or subcontractors, particularly in projects where project workers are employed by third parties.

6. Policies and procedures.
    - This section sets out information on OHS, reporting and monitoring and other general project policies. Where relevant, it identifies applicable national legislation.
    - Where significant safety risks have been identified as part of Section 2, this section outlines how these will be addressed. Where the risk of forced labor has been identified, this section outlines how these will be addressed (see ESS2, paragraph 20 and related GNs). Where risks of child labor have been identified, these are addressed in Section 7.
7. Age of employment.
    - The minimum age for employment on the project
    - The process that will be followed to verify the age of project workers
    - The procedure that will be followed if underage workers are found working on the project
    - The procedure for conducting risk assessments for workers aged between the minimum age and 18

-

8. Terms and conditions.

- Specific wages, hours and other provisions that apply to the project
- Maximum number of hours that can be worked on the project
- Any collective agreements that apply to the project. When relevant, provide a list of agreements and describe key features and provisions
- Other specific terms and conditions

9. Grievance mechanism.

    - Set out details of the grievance mechanism that will be provided for direct and contracted workers, and describes the way in which these workers will be made aware of the mechanism.

10. Contractor management.

    - The selection process for contractors, as discussed in ESS2, paragraph 31 and GN 31.1.
    - The contractual provisions that will put in place relating to contractors for the management of labor issues, including occupational health and safety, as discussed in ESS2, paragraph 32 and GN 32.1
    - The procedure for managing and monitoring the performance of contractors, as discussed in ESS2, paragraph 32 and GN 32.1

11. Primary suppliers.

    - Sets out the procedure for monitoring and reporting on primary supply workers.

12. Code of Conduct to address Sexual Harassment (SH)/Sexual Exploitation and Abuse (SEA) risks based on the World Bank Good Practice Note on Addressing SH/SEA in projects with Major Civil Works;