

REPUBLIC OF TURKEY  
MINISTRY OF ENVIRONMENT AND URBANIZATION  
General Directorate of Construction Affairs

TURKEY ENERGY EFFICIENCY IN PUBLIC BUILDINGS PROJECT  
(P162762)

**TERMS OF REFERENCE (TOR) FOR**

**CONSULTING SERVICES ON THE DEVELOPMENT OF DETAILED DESIGNS AND TECHNICAL SPECIFICATIONS FOR ENERGY EFFICIENCY BUILDING RENOVATIONS AND OF ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS  
(REF: EEPB/WB/MoEU/QCBS-DES&SUP-02)**

**I. Introduction**

The Ministry of Environment and Urbanization (MoEU) has applied for financing from the World Bank toward the cost of the Energy Efficiency in Public Buildings Project (EEPBP) and intends to apply part of the proceeds for consulting services.

The project investments will focus primarily on the renovation of central public buildings with high energy consumption and shorter pay-back periods. The proposed project would be implemented through two components: (i) energy efficiency (EE) investments in central government buildings; and (ii) technical assistance (TA) and project implementation support. The General Directorate of Construction Affairs (GDCA) under the MoEU has been delegated to assume overall responsibility for the project. This will include completion of the necessary activities to support project preparation as well as implementation for the six-year project period. In parallel, grant funding has been mobilized from the Clean Technology Fund (CTF) to help analyze the investment needs and potential of the central government buildings.

The GDCA has established a project implementation unit (PIU) to administer all aspects of the project, including selection of the buildings, procurement of the various contractors (e.g. energy audits, technical designs, renovation works, construction supervision, savings verifications, technical assistance or consultancies, etc.), and monitoring.

Through the EEPBP, approximately 500-700 public buildings will be renovated for EE. Investments would include building envelope measures (roofs/wall insulation, windows, doors), heating/cooling systems, water heating, pumps/fans and lighting and some renewable energy (RE) applications (e.g., rooftop solar PV, biomass heating, solar water heating, geothermal heat pumps) to offset the building's electricity/fuel use. A limited amount of funds may be allocated for non-EE/RE measures (e.g., rewiring, minor structural repairs, painting, seismic safety, etc.).

Within the framework of the EEPBP, a consulting firm will be employed to prepare detailed designs and technical specifications of selected public buildings.

**II. Scope of Services**

The Consultant will be required to prepare detailed designs and technical specifications for energy efficiency renovations in public buildings based on existing detailed energy audit reports, including architectural, mechanical and electrical designs, technical specifications, cost estimates and bills of quantities (BoQs). The Consultant shall also identify environmental and social risks associated with the planned renovation works and prepare Environmental and Social Management Plans (ESMPs).

The estimated number of buildings for renovation in 3 building complex is 11 buildings and 142.362 m2. The buildings and the locations are listed below:

Lot 2:

List of the buildings	Total number of buildings	Construction Area (m <sup>2</sup> )	Location
Bursa Atatürk Teknik ve End. Meslek Lisesi	6	12.910	BURSA
Bursa Anadolu Kız Lisesi	3	11.772	BURSA
Şevket Yılmaz Eğitim ve Araştırma Hastanesi	2	117.680	BURSA
Total	12	142.362	

### III. Description of the Consultants's Tasks

#### **Task 1: Prepare detailed renovation designs and technical specifications**

**1a) Prepare inception report** to be delivered two weeks after contract signing, which shall: (i) review the energy audit and further define the aims and objectives of the services to be provided; (ii) set out a detailed work program for the rest of the project; (iii) identify potential problems to overcome and possible solutions; (iv) justification of the feasibility of the technical solutions; (v) identify counterpart staff in the Client's office and other organizations; and (vi) include a stakeholder analysis identifying other third party organizations involved in the project implementation process.

**1b) Collect any required information and prepare required supplemental drawings** of audited facilities, where drawings do not otherwise exist. The Consultant will conduct site visits and prepare project plans (drawings) for selected buildings including actual measures of windows, entrance doors, building envelope, and unheated areas – building roof and basement; description of windows, doors, external walls, and materials of which buildings are made.

**1c) Prepare detailed renovation designs and technical specification:** The technical designs and all tender documents for the construction tender will be prepared according to the approved energy audit reports. Following agreement between the PIU and the beneficiaries on the EE/RE measures to be included, the Consultant will prepare detailed renovation designs and technical specifications for works to be tendered and implemented in the selected public buildings. General and specific technical specifications for technical drawings and mechanical and electrical works shall be prepared in accordance with MoEU's "Construction Works, Civil, Mechanical Works and Electrical Works General Specifications". However, if no proposed interventions are being considered for a particular area (e.g., no lighting or other electrical measures), detailed (e.g., electrical) drawings may not be required.

Design drawings should be presented in such a way that:

- The drawings can easily be understood
- They visually communicate the concept to the beneficiary and the construction contractor
- They are legible
- All information from previous revisions and updates are included.

The design drawings should include the following aspects:

- Site layout and the location of the works to be constructed
- Plan views and sections

There will be three sets of technical drawings and details in 1/50 scale, and details including system details (for interventions 1/20, 1/5 scales, 1/1 scale if needed), which have to be compliant with the applicable in force regulations:

- (i) **Mechanical drawings** (in conformity with the heating zone where the building is located): The mechanical installation drawings should include the components recommended to be replaced by the energy audit. Heating, cooling, ventilation and sanitary plumbing projects and system drawings specific to each project should be prepared according to the obtained energy audit reports in conformity with electrical and architectural designs. Heat insulation calculations and reports should be prepared according to TS 825 Standard.
- (ii) **Electrical drawings:** The electrical installation drawings should include the components recommended to be replaced by the energy audit. MV distribution, transformer, generator, UPS, lighting, socket (mains and UPS), mechanical and force distribution, cable transportation, earthing and lightning protection, elevator, table loading tables, strong current column diagram and calculations (lighting, heating, short circuit, voltage drop). Energy efficiency comparisons (comparison of current and new status) should be shown in the corresponding plans. Necessary infrastructure plans should be prepared for the remote monitoring of energy consumption.
- (iii) **Architectural drawings:** Site layout, floor plans/construction plans with all partition types and details, lighting plan for ceilings, interior elevations and sections, and details.

The renovation designs shall be certified by the Consultant according to applicable legislation and standards of Turkey. The specifications shall be prepared in accordance with the Building Code, current By-law Concerning Construction in Planned Areas, By-Law on Building Energy Performance and related Turkish legislation and standards. The draft renovation design must be submitted to the beneficiary for formal consent, and to any required third parties for review and certification. Any comments provided by the beneficiary, third party auditor or the PIU must be taken into account before the designs are finalized.

The technical specifications for each measure should include description of individual actions and unit's measures (BoQs, pricing preambles and costs estimates including a unit price analysis for special items). The consolidated bill of quantities (BoQ) should be prepared in compliance with unit price guidelines of MoEU and other relevant state authorities and market prices, which should include the material/equipment, quantity, technical specifications, and estimated cost. BoQs prepared by the Consultant should be in compliance with pricing preambles, technical specifications and other relevant parts of the tender documents to be prepared. Relevant BoQs and technical specifications shall be prepared by the Consultant in detail and shall be submitted to the Client for approval, following the decision of the Client on which parts of these works shall be integrated to the relevant parts of the tender documents.

The Consultant, before finalizing and submitting the technical designs and tender documents to the PIU, shall present the technical designs to the beneficiary (and their user committees) to ensure there is no objection and technical designs are appropriate for the needs of the beneficiary and function of the building. The Consultants shall submit a letter countersigned by the principal and/or directorates of the relevant public buildings and the Consultant's representative indicating that the principal and/or directorate is informed about and agreed on the Final Architectural, Structural, Mechanical and Electrical works subject to tendering following the decision of the Client on the works approved to be integrated to the relevant parts of the tender documents.

#### **Deliverables**

- 1a) Inception report
- 1b) Supplemental drawings
- 1c) Detailed renovation designs and technical specifications (including BoQs and cost estimates)

#### ***Task 2: Identify environmental and social risks and prepare Environmental and Social Management Plans (ESMPs)***

- 2a) Identify environmental and social risks associated with the building renovations:** Identify environmental and social risks associated with the building renovation, including identifying presence and quantity of any hazardous materials (specifically asbestos and mercury containing light-bulbs) that would have to be removed as part of the renovation works.
- 2b) Prepare site specific Environmental and Social Management Plans (ESMPs):** Prepare site-specific environmental and social management plans (ESMPs) in consultation with the construction contractors and submit them to the PIU for approval within 30 days of the construction site delivery. The ESMPs shall include specifications and bill of quantities for removal, packaging, transport and disposal/interim storage of hazardous materials, personal safety equipment and monitoring requirements (the Environmental Mitigation and Monitoring Measures based on the Environmental and Social Management Framework, ESMF) and estimate of costs for the measures. This will also include the location where the asbestos can be disposed and the interim storage location for the mercury containing light-bulbs as per ESMF and Turkey legislation.

#### **Deliverables**

- 2a) Report on environmental and social risks covering each building site
- 2b) ESMP for each building site

#### ***Task 3: Assist the PIU with the bidding process***

Activities under this task would be required during an estimated period of about 3 months after contract signing.

- 3a) Support the PIU in upstream consultations with prospective bidders:** In order to determine appropriate lot sizes and bid packages (i.e., number of buildings per lot or package), the Consultant will support the PIU in at least one upstream consultation with prospective construction firms to gauge their capacity for building renovations – licenses, number of buildings one firm could renovate per month, technical capabilities to meet technical specifications of subprojects, etc. This may also require select phone interviews with a broad cross-section of construction firms. A short, 5-10 pages, note will be prepared summarizing the findings and recommendations on bidding.
- 3b) Assisting the PIU with the pre-bid meeting** in answering the question raised by bidders, site visits, respond to questions about the technical designs and environmental management plans, also assisting the evaluation committee in the debriefing meeting.
- 3c) Assist the Evaluation Committee with technical advice on contractor selection:** Following the bidding process and submission of proposals, the Consultant, shall assist the Evaluation Committee with technical evaluation of submitted proposals for renovation works of the buildings or respond to any question raised by the Committee in terms of bidder compliance with the requirements, feasibility of any alternative technical solutions, etc.
- 3d) Assist PIU with ESCO selection.** One project in the first year will include a renovation by an energy service company (ESCO). For this subproject, a detailed design will not be required. However, once the ESCO has submitted its bid to the PIU, the Consultant will assist as

directed by the PIU to help determine bid responsiveness, technical viability of the proposed measures, reasonableness of energy savings estimates, checking of NPV calculations, etc. Once the award has been made, the Consultant will review the final technical design submitted to the PIU by the ESCO and provide comments to ensure its completeness and conformity with national requirements.

#### **Deliverables**

- 3a) Report on market study
- 3b-c) Completion of assistance to PIU with bidding process leading to successful signing of contract with construction company
- 3d) Completion of assistance to PIU with bidding process for ESCO pilot and Review of ESCO detailed designs

#### **IV. Deliverables and payment schedule**

All Documents need to be in Turkish language. The documents of the first 5 buildings will be also in English. Approved detailed designs and technical specifications shall be delivered as one hard copy (signed and stamped) and three DVD soft copies (including drawings in PDF and AutoCAD format).

The deliverables for each task will be submitted to and approved by the PIU. The Consultant must obtain approval for each deliverable before moving to subsequent tasks. The table below summarizes the deliverables and includes an indicative timeline and payment schedule.

<b>Task</b>	<b>Deliverable</b>		<b>Deadline</b> (months after contract signing)	<b>Payment</b> (% of total payment)
1	1a	Inception report	1 <sup>st</sup> month	5%
	1b	Supplemental drawings		
	1c	Detailed renovation designs and technical specifications (including BoQs and cost estimates)	2 <sup>nd</sup> month	50%
2	2a	Report on environmental and social risks covering each building site	3 <sup>rd</sup> month	10%
	2b	ESMP for each building site	3 <sup>rd</sup> month	10%
3	3a	Report on market study	1 <sup>st</sup> month	10%
	3b-c	Assistance to PIU on preparation of bidding documents and bidding processes	3 <sup>rd</sup> – 4 <sup>th</sup> months	10%
	3d	Assistance to PIU with bidding process for ESCO pilot review of ESCO designs	2 <sup>nd</sup> - 3 <sup>rd</sup> months	5%

#### **V. Facilities provided by the consultant**

The Consultant must ensure that its professional staff has adequate support and equipment. All costs for equipment and administrative and logistic support must be covered by the Consultant and included in the bid price, including:

- All costs arising from the activities of its staff during the contract period, including accommodation, allowances, transportation, insurance, etc.
- Automotive, equipment, office supplies and hardware and software to ensure that the monitoring is fully functional;
- All communication costs, including fax, email, telephone, etc.
- All the equipment, instruments, services and logistical support required for the implementation of the contract, and any costs incurred during its preparation of documents and drafts, copying, printing, etc.
- Technical equipment at the monitoring site;
- Other equipment, instruments, services and logistical support necessary for the implementation of the contract.
- Excellent written and spoken English and Turkish is required. If the Consultant will require a translation services, it will be at his own expenses and the Consultant will be responsible for the accuracy of the translation.
- The Consultant is required to obtain all the necessary permits, approvals, payment of all fees and contributions, as well as all the other elements necessary for the work of his professional staff who is engaged at his own expense for the performance of this Contract.

## **VI. Timeline**

This assignment will be held prior to the third quarter of 2020 and finalised in 4 months period.

### **Key staff**

- 1 Team leader / Engineer with at least Master degree in Civil Engineering or Mechanical Engineering with 10 years experience relevant to the project.
- 2 Mechanical Engineer with at least 5 years professional experience relevant to the project, preferable in energy efficiency and renewable energy; with at least Master degree, having expertise on M&V,
- 3 Electrical Engineer with at least 5 years professional experience relevant to the project, preferable in energy efficiency and renewable energy; with at least Bachelor degree, having expertise on M&V will be an asset,
- 4 Architect with at least 3 years professional experience in energy efficiency and renewable energy and relevant to the project; with at least Bachelor degree.
- 5 Environmental Engineer or equivalent with at least 3 years of experience in hazardous material inventories in buildings, in particular asbestos and experience with requirements and practice for proper asbestos and mercury containing CFLs removal, handling, transport and disposal/storage including monitoring and personal safety equipment requirements, with at least Bachelor's degree.

### **General qualifications of all consultants:**

- Strong knowledge of local laws, standards and norms about building construction
- Prior experience on energy auditing of buildings and preparation of detailed technical designs
- Engineer's authorizations for design preparation in public buildings in compliance with local legal requirements
- Knowledge of environmental management, health and safety
- Good communication, management, organization and reporting skills
- Excellent knowledge of Turkish and English language.
- Excellent communication, presentation and use of basic computer (Microsoft office, AutoCAD etc.) skills.

**VII. Support to be provided by the client to the consultants**

- The client will provide the consultant the existing drawings in dwg or pdf format (if the drawings exist)
- The client will provide the consultant detailed energy audits of the buildings to be renovated.
- The client will sign letters with the beneficiary buildings that describe the responsibilities of the beneficiary, including appointing a contact/facility coordinator for all project phases, facilitating access to buildings or facilities, providing existing documentation, etc.