

## TERMS OF REFERENCE

<b>Item:</b>	Energy audit and technical inspection of facility – "Municipal state institution "School - IT-Lyceum No. 23 named after Zhumabek Tashenov", Turkestan city
<b>Project name and number:</b>	Project «Scaling up energy efficiency / energy saving and modernization in a secondary school, Turkestan region, Republic of Kazakhstan».
<b>Contract type:</b>	Contract for provision of professional services at the location of the facility
<b>Location of the facility:</b>	Turkestan city, Turkestan region
<b>Duration of work:</b>	2 (two) months from the date of signing the contract

### Introduction:

The project with participation of Agip Caspian Sea BV and UNDP, implemented with support of Turkestan Region Akimat, will focus on several areas, namely, energy-efficient lighting, heating and renewable energy sources. Expected outcomes: capacity-building and raising awareness of relevant municipal stakeholders and city residents about environmental lighting systems, creating more favorable policies at the local and national level, and demonstrating practical models for institutional development of environmental lighting project in Turkestan region of the Republic of Kazakhstan.

In accordance with items 1.1. and 1.2. of the WORK PLAN of Joint Project of Agip Caspian Sea BV and the United Nations Development Program "Scaling up Energy Efficiency / Energy Saving and Modernization in secondary school of Turkestan region, Republic of Kazakhstan" (hereinafter referred to as "Project"), it is necessary to conduct an energy audit and technical inspection of facility - "Municipal State Institution" School - IT-Lyceum No. 23 named after Zhumabek Tashenov".

To perform energy audit and technical inspection, it is planned to attract accredited organizations in accordance with requirements of the current legislation of the Republic of Kazakhstan in the field of energy saving and increasing energy efficiency and in the field of architectural, urban planning and construction activities.

For reference: according to the Statistics Agency of the Republic of Kazakhstan, sector of buildings consumes about 40 % of supplied thermal energy. The reasons for high energy consumption in sector of buildings are high heat losses and non-regulated consumption. According to available data, the potential for reducing heat consumption in the sector of buildings ranges from 25 to 35 %. Low efficiency of heat supply requires significant fuel and material resources, produces harmful impact on the environment, including greenhouse gas emissions, and worsens comfort and living conditions of the population.

### Inspected facility:

- "Municipal state institution "School - IT-Lyceum No. 23 named after Zhumabek Tashenov " including stand-alone building of boiler house.
- Equipment that ensures unimpaired operation of the facility. e.g. boiler room and all other

equipment for the school functioning, electric cabinet and etc.”

*The main objectives of comprehensive survey (energy audit + technical inspection) of the facility:* conducting an energy audit to assess and analyze existing situation on energy consumption of the facilities, determining potential for energy saving (with an emphasis on thermal energy for heating and hot water supply) with development of the most profitable/quickly repaid organizational and technical measures aimed at energy saving and improving energy efficiency of the facility, taking into account applicability of renewable energy technologies (RES), preparing feasibility studies and justification of the proposed measures, for the purposes and on the grounds provided for by legislation in the sphere of energy saving and improving energy efficiency and in the sphere of architectural, urban planning and construction activities.

#### *Energy audit tasks*

- search for energy saving opportunities and assistance to business entities in determining directions for efficient use of energy resources;
- identify of reserves and potential opportunities for saving energy resources;
- develop a program of energy-saving measures, introduction of energy-saving technologies;
- define economic effect from introduction of energy-saving measures;
- define payback period for energy-saving measures, including use of renewable energy technologies and costs of their implementation;
- improve system for control and accounting of energy consumption;
- develop energy passport of the facility.

It is planned to demonstrate an integrated approach to low-carbon modernization and management of urban municipal property through this work, including buildings/facilities and structures, taking into account use of renewable energy technologies for further possible scaling.

#### **Scope of work on energy and technical inspection:**

Stage 1. Development of a detailed energy audit plan, on an item-by-item basis, indicating the responsible executors and schedule of works. The work plan should include the following tasks: planning of energy scanning and collecting necessary data, including information on thermal loads (heat/electricity consumption), water, as well as utility bills, etc.

Stage 2. The measurement stage, where necessary instrumental surveys and visual observations are performed, in order to obtain information about the actual parameters of energy consumption and thermal characteristics of the building, including thermal imaging and illumination intensity audits of premises and classrooms. The stage should also include the following mandatory activities:

- identification and development of measures to improve energy efficiency, with breakdown by types of energy resources (electric energy, thermal energy, water, gas and establishment of indicators with normative values;
- calculation of energy-saving potential values for each individual indicator, for buildings and types of process and energy equipment;
- calculation of projected annual energy savings in physical and monetary terms;
- identifying reasons for irrational use of fuel and energy resources (FER) and determining reserves for saving fuel, gas, energy and water at the facility;
- thermal imaging survey of buildings and structures in order to identify the quality of thermal insulation in enclosing structures;

- calculate the volume of standard consumption of thermal energy (heating, ventilation, hot water supply) in accordance with SN RK 2.04-03-2011 "Building heat insulation" and comparison with actual data;
- inspection of ventilation and air conditioning systems, system for production and distribution of compressed air;
- inspection of water supply, sanitation and water consumption systems;
- inspection of heat and cold supply system and heat consumption;
- inspection of power supply and power consumption system;
- inspection of food production unit equipment;
- determining baseline of specific energy consumption for the whole of facility;
- development of measures to replace main equipment with alternative equipment, taking into account the latest developments in energy efficiency and renewable energy technologies;
- developing a set of technical and organizational measures aimed at improving energy efficiency;
- determining energy efficiency class of the facility;
- energy audit is carried out taking into account seasonal characteristics of inspected facility.

Stage 3. Analytical stage at which the following is analyzed:

- Analysis of obtained documentary data and the results of instrumental survey with formulation of conclusions and proposals for determining energy saving potential,
- Analysis of existing energy and heat consumption, identification of causes of heat losses, increased energy consumption and measures to save resources, including the final stage in accordance with the Rules of energy audit

Stage 4. The final stage, where the results of energy survey are documented, report is compiled, including development of energy-saving measures aimed at efficient use of energy, assessment of financial investments in energy-saving measures, taking into account the following:

- at developing economically feasible measures, it is not allowed to generalize, approximate estimate or use conditional percentages of saving. Technical justification of energy saving measures should be carried out in natural measuring units, based on actual data with minimal use of subjective expert assessments;
- all initial data for investment calculations must be confirmed by a technical calculation, accepted on the basis of reference documentation and / or on the basis of commercial proposals (with a reference to the source) and obtained by direct measurements;
- recommendations for energy saving and rational use should not reduce the level of safety and comfort of students and school staff, this should be confirmed by assessment of possible risks associated with implementation of each specific measure;
- technical and economic calculation of energy saving measures, including use of renewable energy technologies, related to replacement of main or auxiliary equipment must be carried out on the basis of officially submitted commercial proposals of at least two potential suppliers and guaranteed technical data of the equipment;
- technical and economic calculation of energy saving and energy efficiency measures should reflect specific economic indicators in accordance with international practice (net present value, internal rate of return, payback period).

Stage 5

- Carry out assessment of technical condition of the facility, including condition of roof, surrounding area, heating, power supply systems, for the possibility of installing renewable energy technologies.
- Evaluate existing planning solutions of the adjacent area, including green plants, solid waste

disposal areas, etc. for compliance with the current standards, taking into account goals, grounds and requirements of the Rules for conducting a technical survey of reliability and stability of buildings and structures.

#### Stage 6

- Develop detailed technical terms of reference for design (provide recommendations on the need to develop design in accordance with the legislation) and implementation of planned energy-efficiency measures at the facility and in surrounding area,

#### Stage 7

Conduct a presentation and discussion of planned activities and their cost for the Akimat of Turkestan region, together with the customer, and prepare an analytical report on performed work.

Analytical report must be accompanied by the results of the energy audit, prepared in accordance with the legislation in the field of energy saving and energy efficiency improvement, and results of technical inspection, prepared accordance with the legislation in the field of architectural, urban planning and construction activities.

According to the results of the energy audit, it is necessary to provide information about energy efficiency class of the facility, in accordance with its marking, which is issued in A4 format.

#### **Deliverables:**

<b>№</b>	<b>Deliverables</b>	<b>Expected timelines</b>	<b>Checked and approved</b>
1	Detailed energy audit plan of each objects including responsible personnel and work schedule Completion form – report (stage 1)	2 weeks after signing the contract	Project Team/Project Committee *
2	Provided results of instrumental examinations and visual observations of the actual parameters of energy consumption and thermophysical characteristics of the building, including the results of thermal imaging examination and light audit of premises and classrooms, are provided.  Provided analysis of the data and the results of an instrumental survey are provided with the conclusions, and proposals for determining the potential of energy saving  Provided analysis of the existing energy and heat consumption is provided, the identification of the heat losses, increased energy consumption and measures allowing to save resources, including the final stage in accordance with the Rules for conducting an energy audit  Completion form – report (stage 2,3)	4 weeks after signing the contract	Project Team/Project Committee

3	<p>Provided results of energy scanning provided, reporting including energy saving measures, efficient energy usage, assessment of financial investments into energy saving measures.</p> <p>The technical condition of the facility assessed, including the condition of the roofs, adjacent territory, heating systems, power supply, for the possibility of installing renewable energy technologies.</p> <p>The existing planning solutions of the adjacent territory, including green spaces, sites for the collection of solid waste, etc., assessed for compliance with the existing standards, taking into account the goals and requirements of the Rules for the implementation of a technical survey of the reliability and stability of buildings and structures.</p> <p>A detailed terms of reference for the design has been prepared (to provide recommendations on necessity to develop a design project in accordance with the legislation) and the implementation of the planned energy-efficient measures at the facility and in the adjacent territory.</p> <p>Completion form – report (stage 4,5,6)</p>	6 weeks after signing the contract	Project Team/Project Committee
4	<p>A presentation and discussion of the planned activities and related expenditures to the Akimat of the Turkestan region was held and Final technical report on energy audit and technical inspection is prepared (Stage 7)</p>	8t weeks after signing the contract	Project Team/Project Committee

\*Chairman of the Project Management Committee - representative of the Akimat of Turkestan regions, members of the Project Management Committee - representatives, UNDP and Agip Caspian Sea B.V.

**Work site:**

Note: If the Service Provider is located in other cities of the Republic of Kazakhstan, the Service Provider should calculate required number of trips to Turkestan (not more than 3 trips lasting about 5 days each, not including travel days) to perform required amount of work and achieve required high-quality results. In this case, all travel expenses (travel, accommodation, daily and other expenses) must be included in the total cost at submitting financial offer.

**Requirements for deliverables:** drafts and final versions of documents shall be provided in Russian in an electronic version in MS Word (2007 or later), Final technical Report on energy audit and technical

inspection shall be provided in three copies – in hard copy and in electronic format. Font used: Calibri, size 12, for electronic format – MS Word extension (2007 or later), PDF.

**Responsibility and accountability:**

- Coordinates its activities with the Project team and other experts invited by the Project team;
- Ensures timely and high-quality execution of requirements of the ToR and Contract conditions

**Required skills and experience:**

Service provider may be a company / organization that is duly registered and meets the following requirements:

- 1) Have legal capacity to conclude business contracts (certificate of registration/re-registration, constituent documents);
- 2) Be solvent, not subject to liquidation, its property should not be seized, its financial and economic activities should not be suspended in accordance with the law (certificates confirming absence of debts in banks and tax authorities, financial statements for 2018-2020);
- 3) The service provider must have a certificate of accreditation and be included in the register of legal entities engaged in energy saving and energy efficiency improvement, published at the website of the Ministry of Industry and Infrastructure Development of the Republic of Kazakhstan, which is the authorized body in energy saving and energy efficiency improvement
- 4) Service provider must have certificate of accreditation for carrying out engineering survey works, its team should include at least 3 (three) experts who have certificates for performing technical inspections of reliability and stability of buildings and structures, as well as one expert who has a certificate for examination of structural part of urban planning, pre-design and design estimate documentation, engineer-surveyor who carries out activities at facilities with first and second levels of responsibility
- 5) the Supplier should have a data measuring system in accordance with the requirements of the Law on Energy Saving and Energy Efficiency Improvement, with documents confirming availability and calibration of data measuring system;
- 6) The service provider must confirm the presence of at least 4 (four) qualified, certified energy auditors (specialists), each of them should have a total technical experience of at least 3 (three) years, including at least 1 (one) year in the energy audit organization. With that, energy auditors must have different technical specialties, including at least one specialist in power supply, one in heat supply, one in construction;
- 7) The Supplier provides the Customer with warranty for all provided Services for a period of 24 (twenty-four) calendar months from the date of signing Delivery and Acceptance Act of Services by the Parties. In case defects in quality of calculations, use of incorrect methods or unintentional provision of distorted information within the framework of provided Services are detected within the above warranty period, the Potential Supplier is obliged to correct identified defects on its own and at its own expense within the period, not exceeding 30 (thirty) calendar days from the date of receipt of the relevant request of the Customer, or accept another term for correcting defects in performed works by mutual agreement.
- 8) A list of performed similar services, indicating the Customer, description of services/works, year when the services were provided and cost (if possible),
- 9) Work schedule (to include composition of the team and distribution of responsibilities, brief description of the methods of work),
- 10) At least 3 reviews and recommendations from previous customers for similar services,
- 11) The staff should consist of the following specialists (with provision of detailed CV, diplomas and other documents confirming experience and qualifications).

**Team Leader:**

- Higher technical education,
- At least 7 years of experience in energy audits/technical inspections of buildings and structures,
- At least 5 years of experience in projects for comprehensive thermal modernization of buildings,
- Excellent knowledge of legislative and other regulatory documents in the field of construction, ecology, energy efficiency, housing and utilities, and sustainable development,
- Excellent skills in presenting information and writing reports,
- Certificate of professional engineering certification and / or energy auditor

**Expert 1-energy auditor:**

- Higher technical education/in architectural and construction design,
- At least 5 years of experience in design organizations in engineering and technical positions,
- Practical experience in implementing energy-efficient projects,
- Knowledge of methodological and regulatory documents on design, construction and operation of facilities; technical, economic, environmental and social requirements for designed facilities,
- Advanced PC user: MS Office, Open Office, Adobe Acrobat,
- Certificate of professional attestation of energy auditor

**Expert 2:**

- Higher technical education/ in architectural and construction design
- At least 5 years of experience in design organizations at engineering and technical positions and / or in organizations specialized in conducting technical inspection of reliability and stability of buildings and structures,
- Experience in design and preparation of estimates and financial\technical and economic calculations,
- Practical experience in determining cost of repair, installation and construction works for energy-efficient projects,
- Excellent knowledge of design documentation and a confident user of CAD systems (CATIA, NX, PTC Creo, AUTOCAD, SOLIDWORKS, COMPASS)
- Evidence of professional certification for examination of urban planning, pre-design and design estimate documentation of structural part

**Scope of price proposal and payment schedule:**

%	Stage
20	Result 1
30	Result 2
30	Result 3
20	Result 4

**Recommendations for submitting a proposal:**

- Completed and signed Service Provider application form according to UNDP template (Appendix 2a, 2b);
- Brief description** of why the company considers itself most suitable for this work, as well as a methodology describing what approach will be used and how the task will be performed.

- c) **Financial proposal** indicating the full amount of contract, including all costs, as well as their breakdown according to the template. If the tenderer is a member of an organization / company/institution and he / she believes that his / her employer will appoint a management fee in the process of his/her release for working under the UNDP loan repayment agreement, then the tenderer must specify this item and ensure that all costs are properly included in the financial proposal, submitted to UNDP.

**Criteria for selecting the best proposal**

Evaluation of qualification and methodology will amount to a maximum of 70%, maximum assessment of price proposal is 30%.

**Terms of reference approved:**

Syrym Nurgaliyev  
Project Manager

Syrym Nurgaliyev

Date: 14.06.2021

Nuri Ozbagdatli  
Portfolio manager

Nuri Ozbagdatli

Date: 14.06.2021