BOSNIA AND HERZEGOVINA

FEDERATION OF BOSNIA AND HERZEGOVINA

ADDITIONAL FINANCING FOR ENERGY EFFICIENCY PROJECT–ID P165405

TERMS OF REFERENCES

for the Consultant

for provision of services related to the upgrade of the existing automated energy consumption and savings monitoring system

Ref. No. BEEPAF-P165405-CQ-27-CS-20-FBIH

1. Background

The Government of Bosnia and Herzegovina (BH) has recognized the importance of energy efficiency (EE) to support sustainable economic growth and move towards EU accession and has received financing for the Additional Financing for the Bosnia and Herzegovina Energy Efficiency Project (BEEP) from the International Bank for Reconstruction and Development (IBRD) credit funds. The project development objective is to demonstrate the benefits of energy efficiency improvements in public sector buildings and support the development of scalable energy efficiency financing models. The AF BEEP became effective March 2020.

The project is supported by a US$32 million IBRD credit for BH, which is made available to the two entities, with US$ 19.23 million allocated to the Federation of Bosnia and Herzegovina (FBH). The project consists of three components implemented separately in each entity:

Component 1: Energy efficiency investments in public facilities
Component 2: Support for the development of scalable financing mechanisms and capacity building
Component 3: Project Management

The project implementation unit (PIU) established within the Ministry of Spatial Planning of the Federation of Bosnia and Herzegovina (FMPP) is responsible for the preparation, coordination,

management and implementation of the project in the Federation of Bosnia and Herzegovina, including procurement, contracting, and payments of all goods, works and services related to the project.

This Terms of Reference (ToR) defines the nature and detailed scope of an assignment for an upgrade of the existing automated energy consumption and saving monitoring system.

The system is planned to be used by three user levels. First one, PIU/FMPP with all administration rights (add, edit, view, import, export,). Second level are Owners (mostly Cantonal Ministries) with restricted rights (they can see only the data from the buildings in their ownership. They can view and export data). Third level are End Beneficiary. They can view and export data only for their building

The Consultant will coordinate activities with, report to and work under the direction of the PIU Project Manager/Coordinator and PIU Technical Experts.

Current Status of the System

One of the development objectives of the BEEP AF is to demonstrate the benefits of improving energy efficiency in the public sector facilities and to support the development of flexible models for financing the energy efficiency.

Energy efficiency measures mainly imply construction works, but also proper energy management. Energy management means that energy consumption is reduced and energy costs and environmental impacts are also reduced, while the conditions of use and comfort of users maintain at least at the same level. In order to manage energy systematically, it is necessary to:

1. Monitor energy consumption,

2. Analyze and process the collected data with the aim of defining energy consumption indicators, setting energy efficiency improvement targets, comparing the obtained indicators with indicators in similar objects and interpreting the results obtained by the analysis,

3. Develop and propose energy efficiency improvement projects based on the results of analysis and processing.

One of the activities within the project is to monitor effects of implemented energy efficiency improvement measures. Monitoring of energy consumption and thermal comfort in the facilities within the project is done by monitoring of the following data and information: i) electricity and water bills submitted by the end beneficiaries, ii) invoices for thermal energy (energy sources) submitted by end beneficiaries, iii) readings from calorimeters installed in buildings as part of project activities, iv) readings from temperature/humidity sensors installed in buildings as part of project activities.

Heat meters and temperature/humidity sensors are installed in public buildings retrofitted within the AF BEEP project. Installation of the additional equipment enabled the remote data reading in real time. The system uses the M-Bus communication protocol.

The current monitoring system collects the following data:

- Data from the Heat Meters (cumulative amounts of energy consumption with corresponding IDs that are transferred to the central database through the server-client communication. Transferred data contain the following information: measuring point ID, timestamp, sending time, measured value (in KWh), start and return temperature of heat transfer media (in °C) and discharge of heat transfer media (in m^3/h).
- Indoor and outdoor temperatures and air humidity data at the public building locations.

These data are collected with the timestep of 1 hour.

Main Server with database and web based application that collects and stores data is located at the Federal Ministry / PIU premises. Application is used for data collection, storage, data display and data export. Besides automatic Meter/data readings, there is an option of manual data input for the Meters that are not connected on the Automatic data reading system (for example water consumption and electricity consumption meters).

Scope of Work for the Consultant

The Consultant is expected to upgrade the existing system and improve the system's analytical functionalities, energy efficiency control and management functionalities, and reporting and presentation functionalities. The main purpose of this assignment is to enable an advanced use of already collected data used for monitoring of basic energy efficiency variables and enable their processing and aggregation for the purpose of analytical reporting on the energy consumption, energy savings, cost savings, CO_2 emission reduction, and comparison of the results with the standardized benchmarks. Also, the system's upgrade should enable better control and management of energy efficiency parameters for each user, and ability of the system to alarm the system administrators and managers of public buildings about variables that went beyond acceptable limits. The new modules should create the automated reports in accordance with the report structures agreed with the PIU management.

The system is intended to cover already included public buildings. But the system need to have an option to add new metering points so new buildings could be added as measuring and remote reading equipment be installed on the new sites.

The upgraded system will improve PIU and FMPP capacities for policy design and better design of energy efficiency programs and project.

General

Centralized database; Support for web services; Support for remote access; Modular system; Modification of user data (Modification of basic user data, Change the access password, Transfer of access rights etc.); Detailed user and administrator instructions in one of the official languages; Support for most common used web browsers; Support for different OS platforms, Support for Java and .NET technology, Support for FTP, SMB, UDDI, WSDL, LDAP , HTTP, XML, Support for multiprocessor systems, Support for encryption, SSL and electronic signature, Support for MS SQL Server Express and serices

New Systems Functionalities

The upgrade design should perform data validation, error management, data conversion and aggregation, calculations through the web application user query and presentation of meta data about quality of results (missing data, number of measurements in a given period of time, etc.).

Therefore, the Consultant is expected to add at least the following functionalities to the existing system:

1. Validation function
2. Reference management function
3. Data and time periods alignment function
4. Conversion of text data into numerical data
5. Unification of missing data function
6. Different sources data merging function
7. Data grouping and aggregation function
8. Statistical verification of data quality function
9. Data preparation for visualization and visualization function
10. Data download and presentation functions
11. Different analytical function (as required and agreed with the PIU management)
12. Reporting function

The scope of the services of the Consultant will include but not be limited to upgrade of the existing system with the following modules:

- Login system and administrator interface for user management (different user types with different permissions: Admin – view, create, edit, set, export, delete, etc.; Owner and End Beneficiary – view and export data for their facility/ies, import data with the Admin permission etc.) Data administration: User management (Add, change and delete system users; Change user group; Modify all user data); Definition of user

access rights; Administrator module for configuration.

- Administrator interface for entering additional data and registering new measuring points / objects / calorimeters (Basic information about the building: Location (Canton, place, address), Type of facility (educational, medical, administrative, other), Link to the BEEP web page, Image of the object, Total investment, Planned savings, CO_2 reduction; Energy data – Baseline data: Water consumption before, Electricity consumption before, Heat consumption before, Qh,nd according to DEA, Qh,nd according to energy certificate, Different coefficients; etc.)
- Module for downloading energy consumption data from the existing database (existing database is an open SQL database)
- Module for manual import of data (Copy or import data from a file: water and electricity consumption and fuel consumption; Admin or End User with a rights given by Admin)
- Module for downloading climate data from third sources (Download and store temperature data for every location with defined timestep from a defined weather web site)
- Module of transformation, aggregation of climate data, consumption data
- Module for the calculation of energy saving, CO2 emissions and money savings (Calculations based on comparison of entered Baseline data and measured/imported new data using defined coefficients)
- Module for projections of energy savings, CO2 emissions, cash savings, payback periods with confidence interval
- Module for data visualization savings and projection calculations (Display facilities on a map, Tabular display of objects – list, Charts, etc.)
- Reporting module (Reporting system integrated in the application; Modular system; Expandable system by manually adding new descriptions and procedures; Ability to add new reports; Export reports to Microsoft Word, Microsoft Excel and Portable Document Format)
- Alarms/Notifications module (Option to alarm by e.mail if critical values that are set are exceeded; Notification on errors in distant data readings, Alarms on high average indoor temperatures, Alarms on high instantenous heat energy consumption, etc.)
- Module for automatic sending of data to EMIS (Energy Management Information System).

The PIU and FMPP reserve the right to redefine or expand the list of modules the Consultant is expected to design.

The Consultant should enable data sharing with other systems and web-platforms, including the ones that will be developed by the Project through the public buildings

The web application should be user friendly, and allow for customization by user/s to suit data processing and visualization needs.

The web application should be developed based on the following principles:

- Designed with the user and incorporates the key users suggestions
- Designed through iterative process that allows for incorporating feedback from PIU management

Copyright and intellectual property protection

All generated documentation and other types of information in electronic or hard copy, which arise during the contractual relationship with the PIU and the FMPP, becomes the permanent property of the PIU and the FMPP, which reserves the right to make modifications and changes. All information, provided through documentation, access to databases or in any other way, and owned by the PIU and the FMPP, the Service Provider/Supplier must not use outside the scope of contractual obligations and has the obligation to protect against unauthorized use. For this purpose, the Supplier is obliged to sign statements on information protection provided by the PIU and the FMPP.

Duration of Contract

Expected duration of the contract is 6 months during the period from January 2022 to July 2022.

Qualification requirements and basis for evaluation

The Consultant should be a qualified firm or joint venture of firms (up to 3 companies for a joint venture) that have demonstrated experience in development of web base analytical applications, and prove its capacity to apply the experience in energy efficiency sector. The firm must propose a team capable of successfully carrying out all aspects of the ToR with in-depth experience in executing similar consultancies. The Consultant shall demonstrate their capability to mobilize enough skilled staff for carrying out the project activities within the allocated timeframe and include all necessary engineering specialists as part of the proposal by including in the technical proposal the Curriculum Vitae of the proposed key staff, including educational background, relevant working experience in similar projects, and by confirming their availability during the period of the contract.

Interested consultants must provide information indicating that they are qualified to perform the services by fulfilling following requirements:

- Company information: name, registration, address, telephone number, facsimile number, year of establishment, contact person for the project, fields of expertise;

- Confirmation on no obligations relating to the payment of direct and indirect taxes in accordance with the relevant laws of Bosnia and Herzegovina (may not be older than three (3) months) or with the relevant law of the country from the EOI submitter;
- Details of experience in minimum two (2) similar assignments undertaken in last five (5) years, including value of consulting services and value of works, location, name of the Client, type of services provided, contract period of execution;
- Curricula Vitae (short version, specifying experience in similar assignments, minimum three (3) CVs of key personnel from various professions requested under such services) of key staff who will be working on the assignment(s) with minimum:
    - Team Leader, responsible for managing/overseeing the entire consultancy contract implementation; University degree (Master's equivalent) in information technologies; minimum five (five) years of experience in relevant field, including project management of similar assignments;
    - At least one (1) graduated software engineer with at least five (5) years of work experience in relevant field;
    - At least one (1) graduated civil engineer with five (5) years of work experience in energy efficiency field.

Consultants Reporting Obligations

The Consultant will submit monthly report to the Project Implementation Unit of the Ministry of Spatial Planning of the Federation of Bosnia and Herzegovina within 5 days after each month expires with description of the realized activities and the list/specification of the reimbursable costs.

For the purpose of payments for eligible reimbursable costs the Consultant will submit along with the monthly report related proof and appropriate supporting documents/receipts, invoices etc.