



MONTENEGRO
Ministry of Economy
MONTENEGRO ENERGY EFFICIENCY PROJECT

Advertisement for Expressions of Interest
“Technical Monitoring and Evaluation Consultant for the
Clinic Center in Podgorica”
No: MNE-EE-P107992- CQ-S-09-C.1.1

LOAN NUMBER: 7637-ME

Montenegro has received a loan from the International Bank for Reconstruction and Development (IBRD) in the amount of € 6.5 million equivalent toward the cost of the Montenegro Energy Efficiency Project (MEEP), and intends to apply part of this loan to payments under the contract for the Consultant service for performing technical monitoring and evaluation for the Clinic Center in Podgorica.

Description of Services:

MEEP is created to contribute to significant energy savings in a cost effective way in selected public buildings, namely schools, hospitals and dormitories, and though it, to strengthen the capacity of the domestic institutions to implement similar projects in other buildings. The one of MEEP components is technical monitoring and evaluation. Monitoring of the energy consumption BEFORE and AFTER the investments and evaluation of the results is of great importance for the MEEP success, since it is aimed at the verification of the results achieved by implementation of the proposed measures in Detailed Energy Audit and meeting of the overall and specific project objectives.

The Clinic Center (CC) of Montenegro located in Podgorica is a large hospital complex (land area of 163,000 m²) consisting of 12 clinics in 15 separate buildings, with around 40,000 m² of useful area. Two buildings situated in the hospital area don't belong to the hospital, namely Institute for Public Health and Medical School.

Energy system of CC consists of installations of centralized heating system, centralized steam production (laundry, kitchen, and sterilization), a number of distributed ventilation systems, centralized air conditioning in smaller part of the hospital (scanner, magnetic resonance, and X-ray therapy department), and a large number of split air conditioners. Centralized heating and steam production is generated inside central boiler room and distributed by steam and hot water pipe system. Two identical boilers located in boiler room, each producing 8 t/h, are fired by heavy fuel oil. Steam boilers, relatively new commissioned in 2002 and 2006, are equipped with needed auxiliary equipment (feed water heaters, chemical water treatment, and heavy fuel oil station) and there are in relatively good condition. However, boilers are not equipped with adequate Control & Instrumentation system, they provide relatively good monitoring of vital parameters, but not control, according to the sliding diagram. Namely, heating control is manual, and mainly inefficient. Installation of two new steam boilers, each having production of 5 t/h, is ongoing.

Heat from boiler room to the consumers is distributed via hot water pipe system (heating, domestic hot water – DHW), steam pipes (to main building – laundry, kitchen, sterilization; children clinic –

heating, DHW, sterilization; space heating – Institute for public health and Old Oncology building). The children's sector in CC has received a grant from Slovakia to demonstrate solar energy for heating with 81 solar panels (2 m², each) installed on the roof of the building. Air heat pump for air conditioning was also installed on the roofing of Children Clinic.

Space heating of the buildings of Faculty of Medicine and Institute of Public Health (they are not part of CC of Montenegro) is provided from boiler room of CC.

CC also possesses four draws, with pretty stable water temperature of around 15 Celsius Degrees, suitable for application of water heat pumps.

Buildings are in relatively good shape, except for four smaller old buildings (dermatology, neurology, psychiatry, and infective diseases clinics located outside the yard of CC). However, partial replacement of windows (wooden or alumina framed single glassed) may be expected, as well as partial thermal insulation at three buildings of Children Clinic. Lower parts of large glassing areas in the largest building, in particular at corridors, may be partially replaced with better thermal insulating material. Installing of solar thermal collectors and heat pumps may also be expected. The building of oncology is under renovation, which also includes building envelope improvement and indoor heating installations. New building of Oncology Clinic is under completion, following actual construction codes and standards valid in Montenegro. Building of Pathology Clinic is renovated in recent past. Building of Dentistry Clinic is around 30 years old with relatively good envelope (double glassed windows, external walls in good condition).

There is installation for condensate return (kitchen, laundry, partly from sterilization), but is not functional. This causes high heat losses and increase inefficiency of whole energy system.

Steam and hot water pipes are installed more than 30 years ago and condition of thermal insulation is poor, while pipe metal condition is unknown. Pipes are built in concrete channels, partly passable (from boiler room to main largest CC building). Total steam pipe length is around 300 meters.

The electricity consumption of the CC has grown over the years, because of increased demand on air conditioning and increasing installation of individual electric spit air conditioner. However, indoor lighting also significantly contributes to electricity consumption, as well as some medical equipment (scanner, X-ray, magnetic resonance, some electric sterilizations).

The Technical Monitoring and Evaluation (TM&E) Consultant shall be hired to perform technical monitoring of energy consumption and evaluation of energy efficiency for CC, and Consultant services shall include the following tasks:

- (i) Preparation of monitoring and evaluation Methodology as close as possible to the requirements of the general methodology, developed by the project consultants implemented at other buildings (schools, hospitals); Methodology should give the overview on monitoring of heat (fuel, space heating, steam, domestic hot water) and electricity (AC, ventilation, lighting, medical equipment) consumption in CC of Montenegro;
- (ii) Preparation of Monitoring protocol (plan), which implementation will result in sufficiently accurate determination of energy flows in CC and accurate energy consumption breakdown (by consumers-buildings; by part of energy system – boilers, distribution, consumption); Monitoring plan shall define what values, how (measuring equipment), when and how frequently measuring shall be performed; in particular, the Consultant is expected to specify in details measuring devices that he is going to use;
- (iii) Provision of calibrated measuring equipment, own or rented, but not specifically purchased for this assignment, to be used for all measuring in the CC in accordance with Monitoring plan proposed by him and accepted by the Client;
- (iv) Perform technical monitoring BEFORE and AFTER the investments (energy efficiency measures implemented in compliance with the findings and recommendation of feasibility study, carried out by separate consultant during heating and summer season);

- (v) Evaluation of the results, determination of energy consumption breakdown before and after the investments, as well as energy efficiency; and
- (vi) Preparation of two reports: BEFORE the investments and FINAL report (after the investments).

Duration:

Technical Monitoring & Evaluation (TM&E) Consultant shall perform his services BEFORE investments, during heating season 2009/10 (15 days in heating season) and during summer season 2010 (during June-beginning of July, 15 days in summer season).

The technical monitoring BEFORE investment shall start at the beginning of February 2010. Evaluation report BEFORE should be completed by the end of April for heating and by the end of August for air conditioning and ventilation.

Technical monitoring AFTER the investment shall be carried out during the heating season 2010/2011 and during the summer season 2011.

Expressions of interest:

The Montenegro Energy Efficiency Project team now invites eligible Consultant firms to indicate their interest in providing the services. Interested Consultant firms must provide information indicating that they are qualified to perform the services:

- **General qualification of the firm:** Documents defining the constitution or legal status, place of registration, and principal place of business of the Consultant firm; Evidence of financial reporting-- balance sheet and income statement; Proof the payments to the Consultant firm are not suspended; Appropriate bank account abstract, proof or statement of financial capability from the Bank whose client is a Consultant firm;
- **Qualification of the consultant (firm) relevant to the assignment:** Experience in similar projects in last 3 years (for every listed project please submit the following information: name of the project, donator/investors, contract value, realization data, and contact info from donor/investor side);
- **Proposed professional staff:** List of personnel who is going to be involved in this project and their CVs. The key personnel should have expertise in buildings' energy efficiency, boilers, heat substations, HVAC, lighting, in sufficient scope to discuss measured data and quantify the energy consumption and savings, and indoor comfort improvement; A university degree in mechanical and electro engineering; at least 7 years of general experience and at least 3 years in the field of the assignment;
- Consultant firm can submit other documents considered important, and which are not listed above.

Consultants may associate to enhance their qualifications. The associations should clearly indicate the form of the association (Joint-venture or sub-consultancy; member in charge; other member/s and/or sub-consultants). Joint ventures should submit letters of intent indicating their intent to form a joint venture, if awarded the contract, and shall provide the above mentioned information for each member of the joint venture.

A consultant will be selected in accordance with the procedures for Selection Based on Consultants' Qualification (CQ) set out in the World Bank's [*Guidelines: Selection and Employment of Consultants by World Bank Borrowers*](#) (May 2004, revised in October 2006).

Interested consultants may obtain further information at the address below, from 09:00 to 17:00 hours.

Expressions of interest must be delivered to the address below by **20 January 2010**.

**Technical Services Unit
Ministry of Finance
81000 Podgorica, Crna Gora
Telephone: +382 20 201 697
Facsimile number: +382 20 201 698
Electronic mail address: ljandjelic@t-com.me**