REQUEST FOR EXPRESSIONS OF INTEREST

ASSIGNMENT TITLE: RECRUITMENT OF AN INDIVIDUAL CONSULTANT/ CIRCULATING FLUIDIZED BED (CFB) EXPERT

REFERENCE NO: N⁰. 11.07.022/IND/ 1575/REOI/2018/PROC-DGEN-EUCL/MD/JCK/du

Energy Utility Corporation Limited (EUCL) is a subsidiary company of the Rwanda Energy Group (REG). EUCL owns and operates a 15MW power plant that is designed to run on peat. The power station is located in Gishoma, Rusizi District, in Rwanda's Western Province, approximately 210 kilometers by road, southwest of the city of Kigali, the capital and it is commonly known as GISHOMA Peat power Plant.

The peat to fuel the power station is being extracted from the Gishoma marshes, close to where the power station is located. Unfortunately, the peat bog where the power plant sources the fuel is running out of peat to fully meet the plant capacity.

In the effort to find alternative solutions that will allow continuous production of the power station, it was thought that the plant should run on similar fuels like coal.

In that way EUCL needs to understand effects of running the plant on (coal, different fuels, biomass, etc.) with out any modifications as well as required modifications so that the plant is operated on multiple fuels in a safe manner.

It is in regards to the above that EUCL requires consultancy and advisory services in order to mitigate issues that might be entailed by switching from peat to other fuel (peat form a peat bogs, biomass, coal) in a CFB(CIRCULATING FLUIDIZED BED) boiler.

The Energy Utility Corporation Limited (EUCL) now invites eligible, experienced and capable Individual Consultants to express their interest in providing the required services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services:

Qualification of Consultant

- At least a master's degree in mechanical engineering, a higher level is an added advantage

Experience

- Minimum 20 years of work experience in area of heat transfer and combustion.
- Demonstrated experience in development and optimization of design of circulating fluidized bed boilers and auxiliary systems
- Proven understanding of CFB design standards
- Ability to evaluate boiler performance and identify necessary modifications for improving combustion and emission performance
- High understanding of plant emissions and environment concerns related thereto
- High level of attention to detail

- An excellent command of the English language-both written and oral
- Ability to produce quality work within a deadline and under pressure
- Highly developed reporting skills
- Motivated and has the ability to work independently as well as in a team environment
- Willing to share knowledge with client technical team

After the short listing, the selection will be based on the detailed Terms of Reference (TOR) for this assignment with specific objectives, scope of the assignments, Key deliverables, Timing, Competence and Qualifications and other requirements. These are available at www.eucl.reg.rw and DG market website: www.market.gov.rw. The selection of best candidate or best individual consultant will done in accordance with REG procurement manual as updated to date.

Application and Submission

Interested and suitably qualified candidates should submit their Expression of Interest including CVs and a motivation letter highlighting how they meet the requirements detailed in the TOR. All applications should be submitted to the Central Secretariat of the Head of Procurement Management of EUCL and should be addressed to:

The Managing Director
Energy Utility Corporation Limited (EUCL),
KN82 ST 3, NYARUGENGE District, Kigali City,
P.O Box 537 Kigali, Rwanda

Electronic applications will also be accepted and may be sent through: dumuhoza@reg.rw copy to ebugingo@eucl.reg.rw and procurement@reg.rw

The outer cover for envelopes shall be clearly marked:

REQUEST FOR EXPRESSION OF INTEREST (EOI)
INDIVIDUAL CONSULTANT/ CIRCULATING FLUIDIZED BED (CFB) EXPERT
REFERENCE N⁰. 11.07.022/IND/ 1575/REOI/2018/PROC-DGEN-EUCL/MD/JCK/du.

The deadline for submission of expression of interest will be **16th October 2018**, at 10:00 hours Kigali time. Further information can be obtained via email to the email addresses mentioned above during office hours from 07H00 hours to 17H00 on all working days.

Done at Kigali, on **27th September 2018.**

Eric BUGINGO
Head Procurement Management

Maj. Eng. Jean Claude KALISA
Managing Director

TERMS OF REFERENCE: INDIVIDUAL CFB EXPERT

1. Introduction and background to the assignment

Energy Utility Corporation Limited (EUCL) owns and operates a 15MW power plant that is designed to run on peat. The power station is located in Gishoma, Rusizi District, in Rwanda's Western Province, approximately 210 kilometers by road, southwest of the city of Kigali, the capital and largest city in the country and is commonly known as GISHOMA Peat power Plant

The peat to fuel the power station is being extracted from the Gishoma marshes, close to where the power station is located. Unfortunately, the peat bog where the power plant sources the fuel is running out of enough peat to fully meet the plant capacity.

In the endeavor to find alternative solutions that will allow continuous production of the power station, it was thought that the plant should run on similar fuels like coal.

In that way EUCL needs to understand effects of running the plant on (coal, different fuels, biomass, etc.) without any modifications as well as required modifications so that the plant is operated on multiple fuels in a safe manner.

2. Objective

The objective of the assignment is to provide EUCL with a consultancy and advisory services in order to mitigate issues that might be entailed by switching from peat to other fuel (peat form a peat bogs, biomass, coal) in a CFB boiler.

3. Scope of the assignment

The consultant will analyze the design and performance of existing infrastructures (equipment, machinery etc.) and evaluate whether any issue will actually arise when a different fuel is used on a power plant that was designed to run on peat from Gishoma peat bog.

If any potential issues are identified, the consultant will propose modifications, which are required to address those issues.

4. Consultant duties and responsibilities

Under this consultancy and advisory assignment, the consultant will undertake the following duties and responsibilities.

1. Review of design, actual performance of power station components, actual fuel and new proposed fuel (coal) specification and identify issues that may arise when fuels are switched from one to another or used as mixture.
2. Evaluate impact of use of coal on individual power plant equipment and overall performance of the plant.
3. Evaluate the quality and quantity of required coal to produce the same steam as the designed peat
4. Propose required modification on different constituents of the power plant to ensure optimized production of energy from the coal.
5. Evaluate the environmental and health risk associated with emitted gases/Assessment of pollution level as compared to the effect of the peat which the plant was firstly designed for
6. Propose the risk mitigating solution as per the result of above evaluations
7. Analysis of the effect of fuel quality on handling, storage, processing, preparation and ignition stability.
8. Elaborate a comprehensive report on above assignments
9. Supervise plant modification works performed by contractors (if any)
10. Supervise testing and commissioning of the power plant on new fuel

5. Duration of the assignment

The assignment is divided in the following two phases, where the second phase is conditioned by results of the first phase.

Phase 1: Phase one is composed of activities 1 to 8 in the consultant duties and responsibilities section.

Phase 2: This part of assignment will include the supervision of plant modification works to be performed by contractors (if any) and supervise testing and commissioning of the power plant on new fuel.

The consultant will provide a comprehensive report for each activity.

The anticipated duration of phase one of this assignment is 22 days. The duration of the second phase will depend on the modification that evaluation done in part one will propose. Its necessity, timing and scope will be discussed in detail at the conclusion of phase 1

6. Methodology to be used in order to carry out the assignment

The consultant will describe in his proposal the methodology that he intend to use in order to carry out and complete the assignment. It is expected that he/she will create a computer model for evaluating the boiler furnace performance and for evaluating performance for projected fuel/coal

The consult will also visit the power plant in order to get familiar with the plant equipment, discussing operation & issues with EUCL personnel and collecting performance information with peat firing (either from saved data or by recording actual plant performance).

7. Detail outputs (key deliverables to be accomplished)

The consultant is expected to deliver the following key outputs, in collaboration with technical staff at EUCL/GO&M:

- Computer model for evaluating the boiler furnace performance (actual and project)
- The report which details issues that are likely to be entailed by switching from peat to coal or any other fuel (biomass, …), (different coal specifications) in a CFB boiler, as well as required modifications (on the power plant) to allow safe switching between different fuels.
- A 2-day training on CFB design, operation and optimizing plant performance
- Assistance with solving operational issues with coal power plant

8. General experience of the consultant and important aspects of the project to be focused

The consultant should have more than 20 years of practical engineering experience with special focus in areas of fluidized bed, heat transfer, and combustion and emission control.

9. Competencies and qualification of expert;

The minimum professional and technical standards required are:

- At least a master's degree in mechanical engineering, a higher level is an added advantage

- Minimum 20 years of work experience in area of heat transfer and combustion.
- Demonstrated experience in development and optimization of design of circulating fluidized bed boilers and auxiliary systems
- Proven understanding of CFB design standards
- Ability to evaluate boiler performance and identify necessary modifications for improving combustion and emission performance
- High understanding of plant emissions and environment concerns related thereto
- High level of attention to detail
- An excellent command of the English language-both written and oral
- Ability to produce quality work within a deadline and under pressure
- Highly developed reporting skills
- Motivated and has the ability to work independently as well as in a team environment
- Willing to share knowledge with client technical team

10. Set the time periods for the key deliverables identified

The work is expected to start immediately after signature of the contract. A discussion with the client representative to clarify any outstanding issues should be held not later than one week after the signature of the contract.

As an interim deliverable the contractor should submit a draft preliminary report on analysis made based on preliminary data provided by the client before conducting a visit at the power station. This should occur no later than 7 days after the signature of the contract by both parties.

Furthermore, the consultant should hold a presentation at the client premises in Kigali.

The final report shall be provided to the client in soft and hard copies and the whole assignment should be completed in not more than 30 days.

11. Services and surveys necessary to carry out the assignments

- Data for power plant equipment
- Design and projected specifications
- ash flows
- air and gas flows

- fuel flow
- limestone flow for SO2 control
- Required modification
- Short training
- Environment issues

12. Detail the services, facilities and counterpart staff to be provided by EUCL

N/A

13. Reporting arrangement and overall coordination

The consultant will report to the Managing Director of EUCL.

The consultant will work under supervision of the Director of Generation. The supervisor will have frequent interactions with the consultant at various stages in order to brief the consultant on the situation/assignment; agree on the process and clarify the deliverables; provide feedback and comments on intermediary products; and track the progress made by the consultant. The supervisor will evaluate the consultant's work and certify delivery of work.

14. Requirements for transfer of knowledge/ training as part of the assignment

The consultant through an interactive training method will provide a comprehensive understanding of various types of circulating fluidized bed (CFB) boilers. All the components of CFB boilers including furnace, cyclones, economizers, superheaters, reheaters, injection systems, electrostatic precipitators, polishing dry scrubbers, fuel and sorbent feeding systems, bottom ash handling and extraction systems will be covered in summary.

The design, selection considerations, operation, maintenance, diagnostic testing, troubleshooting, refurbishment, and economics as well as, emission limits, reliability, monitoring and control systems of CFB boilers will also be covered thoroughly.

The training will focus on maximizing the efficiency, common problems and solutions, reliability, and longevity of CFB boilers by providing an understanding of the characteristics, selection criteria, common problems, and repair techniques, preventive and predictive maintenance. All the common problems encountered in CFB Boilers will be discussed in detail.

This includes thermally induced failures, anchor system induced failures, water walls tube failures, clinker formation, refractory damages,