Request for Proposals
For Conducting Pre-Feasibility Studies for Three Small Hydro Power Projects in South West Tanzania

Submission Deadline: 17:00 East African Time
April 5th, 2019

Submission Email: tenders@virungapower.com

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ALL PROPOSALS MUST BE SENT ELECTRONICALLY AS AN EMAIL ATTACHMENT IN PDF FORMAT AND SHOULD BE RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.

Issued on: 15th March, 2019
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1. Introduction

InfraCo Africa seeks to alleviate poverty by mobilising investment into sub-Saharan infrastructure projects. InfraCo Africa’s support reduces the risks and costs associated with early stage project development and ensures projects are developed to the highest standards, from concept to financeable investment opportunity. InfraCo Africa is part of the Private Infrastructure Development Group (PIDG).

Virunga Power is a private investment firm focused on developing, owning and operating profitable and sustainable power generation and distribution systems on a community scale in rural areas of sub-Saharan Africa. Virunga invests in electrification projects across the renewables spectrum that create sustainable development benefits for rural communities.

InfraCo Africa (“InfraCo”) has partnered with Virunga Power to develop 3 small hydropower projects in South West Tanzania. InfraCo Africa and Virunga Power (jointly referred to as “The Client”) invite eligible firms to submit proposals for carrying out pre-feasibility studies for these three small hydropower projects.

1.1 Background Information on the Projects

1.1.1 Project #1

The project is located in southwest Tanzania. Preliminary investigations for a run of river scheme estimate the flow rate at the proposed intake to be 5.7 m$^3$/s with a head of 135m. By using 5.7m$^3$/s as design flow, the potential power output for this site is estimated to be 6.8 MW. The generated electricity would be fed into the TANESCO grid. The distance along the river between the intake and the powerhouse is approximately 2.5km.

1.1.2 Project #2

The project is located in southwest Tanzania. Preliminary investigations estimated a design flow of 4.03m$^3$/s and a head varying from 250m to 450m. It is proposed that the generated power, between 9 and 16MW depending on the configuration, be evacuated through a 33kV transmission line to the TANESCO grid. The highest proportion of land in the area surrounding the project is under agriculture which is the main means of livelihood. The distance along the river between the intake and the powerhouse is approximately 3.7km.

1.1.3 Project #3

The project is located in southwest Tanzania and consists of joining 2 adjacent rivers. Preliminary investigations on the first river estimated a design flow of 4.8m$^3$/s and a head of 135m which would yield a potential output of 5.7MW. Preliminary investigations on the second river estimated a design flow of 6.3m$^3$/s and a head of 130m yielding a potential power output of 7.2MW. The Client is planning to develop the site as a single project. The proposal is to have two intakes but a single powerhouse. The powerhouse would be some 2km downstream of the confluence of both rivers, with one intake located approximately 1.2km from the confluence and the second intake located approximately 2.9km upstream of the confluence.
2. Scope of Works

The primary task of the Consultant is to conduct pre-feasibility studies to help confirm the viability of the three projects in order to accelerate the time to construction for these hydropower projects. The Consultant will provide their findings in a pre-feasibility study report that adheres to the industry best practices.

The report should contain preliminary technical and economic analyses. The study will be useful in justifying further investment in the projects’ development at feasibility, financing and later, construction stages. The study will also facilitate application for, and acquisition of initial permitting and licensing such as water rights, land rights and TANESCO’s Letter of Intent (LOI) and PPA. The detailed scope of the services shall be as described in the following sections.

2.1 Data Collection and Review

The Consultant shall be responsible for collecting and reviewing all the data and existing documents prepared by the Client and other relevant sources. The Team Leader and other key personnel of the Consultant shall carry out field visits to the proposed sites to assess the general settings of the projects soon after contract agreement. Based upon these visits and a preliminary assessment of the sites, the Consultant shall submit an inception report to the Client no later than 1 month after contract signing. The inception report should outline the Consultant’s evaluation of the sites, alternative layouts for site development and revised work plan if justifiable.

2.2 Kick off meeting

The Consultant shall be responsible for convening a kick off-meeting at the Clients’ office or at an agreed upon alternative location convenient for the parties. The primary objective of this meeting would be team introduction and a discussion on data review. This would be an opportunity for the Consultant to seek clarifications from the Client as well as the sharing of the details of contact persons from either party. The kick off meeting shall take place no later than 2 weeks after contract signing.

2.3 Topography

The Consultant shall carry out topographic surveys – with a contour of 1 m - covering all possible project layouts, and execution of benchmarks. The objective of this task shall be to complete the topographic survey for the project sites, which will be later used to complete the preliminary design of civil structures. Once the Consultant has determined the final locations for the project salient features, the Consultant shall proceed to complete topographical surveys for each of the three project sites, including but not limited to:

- Carrying out topographical surveys of the entire length of the waterways from the intake weir to the tailrace end, along the river alignment and the hillside above the river along approximate waterway alignment. All control points shall be marked on the ground by permanent bolts cast into the bedrock for centering and elevation reference. At least
three permanent concrete benchmarks - one each at intake site, forebay and powerhouse - shall be constructed. At least two intervisible permanent benchmarks shall be constructed close to the proposed waterway alignment at about every 500 metre interval. The permanent benchmarks shall be established at appropriate locations and shall be used for the topographic survey.

- Surveying the area between the headrace and the river (including the stream course) and preparing whole project site layout drawings showing all project components. The opposite bank shall, however, be surveyed only at the headwork and powerhouse sites to cover the high flood areas. The density of the survey points taken shall be sufficient for the accurate production of 1:50,000 scale maps at 5-meter contour interval for the entire area at each of the project sites; 1:500 scale maps at 1 meter contour interval for access roads; and 1:200 scale maps at 1 meter contour interval for the intake area, waterway and powerhouse including the tailrace.

The topographic surveys shall be adequate to cover the following features of the Project:

- **Intake Weir and Forebay:** The Consultant shall complete a detailed survey of the intake works site. The survey for the intake site shall extend upstream for minimum of 20 meters in elevation and downstream for 100 meters (both banks) along the river channel. The survey shall cover the settling basin area.
- **Waterway:** A detailed survey of waterway area covering the canal/pipe shall cover the nearby streams and rivulets and shall extend at least 50 meters on each side of the penstock centre line.
- **Powerhouse:** The Consultant shall complete a detailed survey of the powerhouse and tailrace areas. The survey shall cover at least 20 meters on each side of the powerhouse centre line along the penstock and tailrace alignments. This survey shall extend down to the riverbed to cover the area extending up to an elevation of 20 meters above the high flood level.
- **Access Roads and Power Distribution Lines:** The Study shall include identification of the approximate location of access roads and power evacuation lines. The topographic map of the access road shall extend 5 meters on either side of the centre line of the proposed roads.

### 2.4 Geology

The Consultant shall collect all relevant geological documents and maps available from government and other private agencies for review. The Consultant shall provide a geological description of the site, identification of rock outcrops, cliffs, gulley, seismic hazards, streams and potential sources of construction materials. The Consultant shall also prepare geological maps of the project sites at scales of 1: 1,000 and overlay them on topographic maps. The geological maps should show the existing rock types, their combination and the various geological and geomorphic elements, their orientation and degree of weathering, geological structures, faults and folds, shear zones, discontinuities, and seepage/springs. The mapping shall cover an appropriate area around the project structures to obtain a clear preliminary understanding of the site geology.
2.5 Hydrology

The Consultant shall assess the quality and adequacy of the available information and make arrangements for the collection of additional precipitation and stream flow data from government agencies and other sources.

The Consultant will install a river gauging station (RGS), within 1 month of contract signing, at each of the three proposed sites complete with the following components;
- Installation of 0-3-meter gauging plates for manual monitoring of river water level
- Installation of water level data loggers (e.g. HOBO loggers). These loggers should be installed in pipes driven into the river bottom with a perforated cap to protect them from damage.

At least three (3) spot flow measurements will be taken by the Consultant at each gauging station. These measurements will be used in the hydraulic modeling. After installation of the gauging station, the Consultant will provide training to selected Virunga Power staff for the running and operation of the RGS. This will entail manual collection of data from the gauging plates and periodic maintenance works including replacement of the logger batteries.

The expected outputs from the data collected and analysed are:
- Discharge series as transposed to the respective intake sites and flow duration curves;
- Design Floods; and
- Low Flow Analyses.

2.6 Assessment of Electro-Mechanical Equipment

The Consultant shall provide a comparison of alternatives and a proposal of the best generation equipment type based on hydrology, topography and location of site.

2.7 Grid interconnection point assessment

The Consultant shall conduct a preliminary evaluation of the suitability of the existing grid for the development of the projects. The Consultant shall provide a preliminary overview of the following:
- Preliminary routes and best alignment of power evacuation line system; and
- The best location to evacuate power from the two plants to the national grid.

2.8 Assessment and Optimization of Layout Alternatives and Installed Capacity

The Consultant shall deliver a preliminary evaluation of alternatives based on the following criteria:
- Technical aspects;
- Financial aspects (costs, energy yield, PPA price); and
- Environmental and Social aspects.
2.9 Pre-Feasibility Designs and Project Drawings

The Consultant shall provide pre-feasibility designs based on the assessment and optimization of layout alternatives. The Consultant is expected to present approximately 15 to 20 project drawings showing:

- Project location showing access and transmission line - Plan view;
- Project layout showing the locations of the main structures, weir/dam, intake, desander, surge tank, etc. – Plan, Elevation and Sections view;
- Waterways – Plan, Elevation/Profile and Sections view; and
- Powerhouse – Plan, Elevation and Sections view.

2.10 Energy Yield Estimate

The Consultant shall perform an annual energy yield analysis based on turbine efficiencies provided by equipment suppliers. The analysis will include all relevant loss factors (e.g., electro-mechanical efficiencies, availability downtime, auxiliary power consumption, etc.). The analysis will also provide probability distributions for energy yields, specifically the energy yields for P90, P50 and P10.

2.11 BoQ and Cost Estimate

The Consultant shall develop preliminary cost estimates for the Project that are representative of each of the project sites to aid in investment decision making (“Cost Estimates”). The Cost Estimates shall be completed for the optimized layout, structure sizes and construction methodology proposed for the Project. The cost of engineering, design, and supervision shall be included in the Cost Estimates as separate items. Appropriate contingencies shall be applied to account for factors that cannot be adequately defined at the pre-feasibility study stage, with adequate justification for each contingency item included in the cost estimates.

2.12 Implementation Schedule

The Consultant shall prepare a schedule of the construction activities based on the selected layout and project location.

3. Reports and deliverables

The following reports and data shall be presented to the client according to the schedule indicated:

- Inception report - 1 month after contract signing
- Draft pre-feasibility study report - 4 months after contract signing
- Final pre-feasibility study report - 6 months after contract signing
4. General Terms and Conditions

4.1 Study period

The Consultant shall complete the Pre-feasibility study within six months of contract signing as shown in the reports and deliverables section above.

4.2 Qualification of the Consultant

The technical proposal should demonstrate the Consultant’s capacity and experience in conducting similar studies, preferably with past regional experience. The Consultant will provide company profile, name, qualification and relevant experience of the proposed team.

4.3 Terms of payment

The contract for this assignment shall be a fixed price contract. The Consultant’s bid price shall be inclusive of all applicable taxes and duties as per the prevailing Tanzanian Government regulations. The bid price shall cover all the Consultant’s staff fee and field expenses including equipment costs and related travel expenditure. The maximum amount available for this work is $225,000 (Two hundred and Twenty Five Thousand United States Dollars), inclusive of taxes. The Client’s counterparties to the contract will be located in the United Kingdom and in Mauritius and the contract will be governed to United Kingdom law.

Payments shall be done on an installment basis upon signing of contract and submission of respective deliverables as shown in schedule below:

- Contract signing and submission of inception report 20%
- Submission and approval of Draft Feasibility Study Report 40%
- Submission and approval of Final Feasibility Study Report 40%

4.4 Submission of proposal

The Consultant shall submit electronic copies of the technical and financial proposals to the email address provided in the RFP. The technical proposal should at a minimum contain the following:

- Statement acknowledging the company’s capabilities to carry out the assignment successfully
- Profile of the firm
- Relevant Company experience on similar assignments
- Technical approach, methodology and work plan
- Signed CVs of the proposed team working on the assignment
- Proof of valid professional indemnity insurance cover

The Consultant must include the following wording in their submission.

The Consultant agrees to:
(a) abide by the PIDG Operating Policies and Procedures, as applicable to the scope of work and services provided. The PIDG Operating Policies and Procedures can be found at https://www.pidg.org/resources/?filter_cat=operating-policies-and-procedures; and

(b) permit the PIDG’s representatives to inspect all of their accounts and records and other documents relating to the performance of the services or required to be maintained pursuant to the agreement and to have them audited by, or on behalf of, the PIDG.

In addition, restitution by the Consultant is required of any amount of the funding from PIDG Members with respect to which fraud and corruption has occurred.

4.5 Legal

The submission of a proposal shall be treated as acceptance that this RFP does not constitute an offer of any kind, this RFP does not create any sort of legally binding relations, and The Client is under no obligation to select any entity for the Assignment, or for any future assignment or services.

Notwithstanding the aforementioned, The Client reserves all rights to approve or disapprove any proposal without giving any reasons whatsoever. If needed, the Consultant will be asked for modifications and presentations of the proposal before approval.

The terms of this RFP, the information provided by the Project Development Partners herein and all other information provided by the Bidder in connection with the services offered to be provided by the Bidder pursuant to this RFP, are to be treated by the Bidder as strictly confidential and proprietary. Such materials are to be used solely for the purpose of responding to this request. Access shall not be granted to third parties except upon prior consent of The Client and upon the written agreement of the intended recipient to treat the same as confidential. The Client may request at any time that any of Company’s material be returned or destroyed.

5. Award Criteria

Proposals will be evaluated by a procurement selection committee of representatives from The Client. The committee will then conduct a final evaluation and completion of ranking of qualified Bidders. The most competitive proposal will be selected on best value for money basis.

The Client shall promptly notify all Bidders of the award and negotiate the Contract with the best qualified Bidder. If parties cannot negotiate a satisfactory contract, negotiations will be formally terminated. Negotiations may then be undertaken with the second most qualified Bidder and so forth.
5.1 Technical Evaluation

The selection of the Consultant will be based on the following criteria:

Table 1: Technical Evaluation Criteria

<table>
<thead>
<tr>
<th>Evaluation Criterion</th>
<th>Points Awarded to Bidder’s Offers</th>
<th>Max points</th>
<th>Firm “A”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technical Experience of Firm</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>i. Specific experience of the Consultant (as a firm) relevant to the assignment</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii. Experience performing prefeasibility studies for hydro power projects in Sub-Saharan Africa</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Key Experts’ qualifications and competence for the assignment</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Project Manager/Hydro Expert</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ii. Hydrologist</td>
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<td></td>
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<tr>
<td>iii. Civil Engineer</td>
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</tbody>
</table>

The number of points to be assigned to each of the above positions shall be determined considering the following three sub-criteria and relevant percentage weights:

- General qualifications (general education, training, and experience): **15% weight**
- Adequacy for the Services (relevant education, training, experience in the sector/similar assignments): **60% weight**
- Relevant regional experience: **25% weight**

3. Adequacy and quality of the proposed methodology, and work plan in responding to the TOR: 50

(The Client will assess whether the proposed methodology is clear, responds to the TOR and work plan is realistic and implementable; overall team composition is balanced and has an appropriate skills mix; and the work plan has right input of Experts)

| Maximum Technical Score | 100 |

5.2 Financial Evaluation

Table 2: Financial Evaluation Criteria

<table>
<thead>
<tr>
<th>Minimum Technical Score</th>
<th>A technical proposal should obtain a minimum of 70 points as a condition for further evaluation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Evaluation Formula</td>
<td>Tender Price</td>
</tr>
<tr>
<td></td>
<td>a) <strong>Basis</strong></td>
</tr>
<tr>
<td></td>
<td>Price including Fees, reimbursables and taxes</td>
</tr>
<tr>
<td></td>
<td>b) <strong>Evaluation Formula</strong></td>
</tr>
<tr>
<td></td>
<td>Financial ( S_f = 100 \times \frac{F_m}{F} ), in which ( S_f ) is the financial score, ( F_m ) is the lowest price and ( F ) the price of the Proposal under consideration including Fees and reimbursable.</td>
</tr>
</tbody>
</table>
| Allocation of Weights | The weights given to the Technical (T) and Financial (P) Proposals are:  
|-----------------------|-------------------------------------------------------------------------------------------------------------------------|
|                       | $T = 0.70,$  
|                       | and $P = 0.30$  
|                       | Proposals are ranked according to their combined technical (St) and financial (Sf) scores using the weights ($T =$ the weight given to the Technical Proposal; $P =$ the weight given to the Financial Proposal; $T + P = 1$) as following:  
|                       | $S = St \times T\% + Sf \times P\%.$ |