



Location: South Africa

Application Deadline: 27 November 2020

Category: Services

Type of Contract: Local Consultant, Individual Contract

Languages Required: English

Starting Date: (Upon contract signature/s by both parties)

Expected Duration of Assignment: 6 months

Title: *Engineering Services for Small Scale Wind Water Pumping at selected Chris Hani District Municipality schools (Phase 1 and Phase 2)*

1. INTRODUCTION

The South African Wind Energy Project Phase 2 (SAWEP 2) is funded by the Global Environment Facility (GEF) with the Department of Mineral Resources and Energy (DMRE) as the Executing Entity/Implementing Partner, and supported by the United Nations Development Program (UNDP) South Africa Country Office. The project objective is to overcome barriers to the attainment of South Africa's Integrated Resource Plan target of 3,320 MW of wind power generation online by 2018/19. In order to achieve this, the project focusses on four components: *Component 1: Monitoring and Evaluation of the implementation of local content requirements, Component 2: Resource-mapping and wind corridor development support for policy-makers, Component 3: Support for the development of small-scale wind sector and Component 4: Training and human capital development for the wind energy sector.* Each component is associated with specific outputs and a set of activities.

2. BACKGROUND

This Terms of Reference (TOR) relates to the SAWEP 2 Component 3: *Support for the development of small-scale wind sector.* A need was identified, following meetings and discussions with Eastern Cape stakeholders, Education, Roads & Public Works etc that were facilitated by Eastern Cape Dept Economic Development Environmental Affairs and Tourism (DEDEAT), to pilot small scale wind water pumping at selected schools in the Eastern Cape. Some of these schools have food gardens and some biogas digester systems that can also benefit from the small scale wind water pumping systems. It was then agreed in a follow up meeting with DEDEAT, Roads and Public Works, Chris Hani District Municipality (CHDM) and Wildlife and Environment Society of South Africa (WESSA) for SAWEP to support (pilot) small scale wind water pumping at selected schools in the CHDM where WESSA is also implementing its Eco schools programme that can benefit and vice versa from the small scale wind water pumping. The small scale wind water pumping systems to be installed will be handed over to CHDM, Roads and Public Works on completion.

Professional Engineering services are required for the techno-economic assessment (PV solar and small scale wind water pumping), design of the small scale wind water pumping RFQ, procurement, evaluation, Owners Engineer services for the installation of small scale wind water pumping systems and hand over as well as project management support of the Groundwater Assessment, Borehole Drilling and Groundwater Management contract (separate bid: Groundwater Assessment with borehole drilling at two selected schools in the Chris Hani District Municipality).

3. OBJECTIVE

- To undertake a techno economic study to determine the most appropriate water pumping solution amongst PV- or small scale wind water pumping systems at selected CHDM schools for which borehole water is a sustainable water supply option.
- To design and compile a detail RFQ, including O&M, Capacity building for small scale wind water pumping at selected CHDM schools with procurement support
- To be the Owners Engineer overseeing the supply, installation and commissioning of the small scale water pumping at selected CHDM schools

- To support the SAWEP PCU with coordination and project management of the Groundwater Assessment, Borehole Drilling and Groundwater Management contract (separate bid).

4. SCOPE OF WORK

PHASE 1 Estimate 2 months

4.1 School Working List

In consultation with the Project Committee (SAWEP PCU, CHDM, DRPW, WESSA) “filter” the list of schools (max twelve) to be supplied by CHDM in terms of:

- Mean wind speed of 5 m/s and higher at 18 m AGL by making use of e.g. the Wind Atlas for South Africa (WASA) Large Scale High Resolution wind resource map
[http://stel-apps.csir.co.za/wasa-data/grids/Wind%20Speed%20Map%20for%20South%20Africa%20\(2018\).kmz](http://stel-apps.csir.co.za/wasa-data/grids/Wind%20Speed%20Map%20for%20South%20Africa%20(2018).kmz)
- Groundwater, trucking in of water and or rain water harvesting are currently the only water supply options
- School water and sanitation supply currently not supported or earmarked for government e.g. covid-19, Accelerated School infrastructure Delivery Initiative (ASIDI), Sanitation Appropriate for Education initiative (SAFE) or any similar gov and or private support program(s)

Present the final list (max five) for confirmation by the Project Committee (**School Working List**)

4.2 Techno economic study

Conduct a focused techno-economic study to determine the least cost option (“levelised cost of water supply R/litre”) and operation and maintenance costs for a solar PV and a wind (electrical)* water pumping system for each of the schools in the School Working List (4.1) and based on the water requirements (drinking, sanitation, food gardens etc) and weather conditions (solar, wind) per school.

Size one appropriate solar PV and one small scale wind water pumping system and adjust for each school’s water demand, solar and wind climate. One visit of the consultant to the max 5 schools (School Working List) is envisaged to acquaint with the school’s water demand, solar and wind climate.

Inputs:

water requirements per day (litre/day)

Solar, wind energy climate making use of available data e.g. Solargis, WASA

Commercial available solar PV and small scale wind water pumping system capital (CapEx), O&M (OpEx) costs

Grid electricity cost R/kWh

Discount rate

Life time (years)

Typical borehole depths (m)

Typical borehole yields (litre)

Wind turbine mast height 18 m

Use appropriate economic tool, calculate and compare for each solar PV and small scale wind water pumping system sized per school:

Annual Energy Production (kWh)

Total CapEx

Annual Operation Cost (Annual OpEx)

Capacity factor

“Levelised cost of water supply” R/litre

Net Present Value NPV (vs grid electricity)

Present the techno-economic study method applied, the findings and results to the Project Committee and indicate for those schools which the small scale wind water pumping “Levelised cost of water supply R/litre” is less or equal than that for solar PV “levelised cost of water supply”, these schools forming the **Candidate School List**.

The Project Committee to make a decision to proceed with the project if for all the schools in the Schools Working List, the solar PV “Levelised cost of water supply R/litre” are less than that for small scale wind water pumping “Levelised cost of water supply R/litre”.

(*While mechanical windmills have to be placed directly above the borehole, in a design where wind is the preferred resource, electrical driven water pumping system can be placed where the wind resource is maximised)

4.3 Schools final selection, groundwater assessment, borehole drilling, Groundwater Management

Support the Project Committee with the final selection of maximum two schools from the Candidate School List

The Project Committee confirm, inform a maximum of two schools to proceed with the implementation of small scale wind water pumping at these two schools forming the **Final Schools List**. The decision will also activate the start of the Groundwater Assessment, Borehole drilling & Groundwater Management contract which is a separate bid implemented in parallel, at these two schools.

PHASE 2 Estimate 4 months

(Phase 2 of the assignment shall only be carried out by the Consultant on receipt of written confirmation from the SAWEP PCU and after satisfactory completion of Phase 1)

4.4 Design and RFQ Small Scale Wind Water system

Design and compile in UNDP format for the two schools, comprising the Final School List, a RFQ: Turnkey Small scale wind water pumping system, including civil and electric works, O&M and Capacity building that is based on the outcome of the techno economic study and groundwater assessment (borehole depth, yield).

The RFQ to comprise of all the hardware and essentials: small scale wind turbine, mast, pump controller, submersible pump, civils, piping etc for connecting with a storage tank (storage tank to be supplied by CHDM, DRPW)

Present, finalise with the Project Committee the design and RFQ Small Scale Wind Water system for UNDP tender.

Support the tender process with technical evaluation support of the bids to be received

One visit by the consultant to each of the two schools (Final Schools List) is envisaged to assist with the design of the RFQ.

4.5 Owners engineering services for the supply, installation and commissioning of small scale wind water pumping systems at two selected schools

The Owners Engineer shall ensure that the Turnkey contractor implements the RFQ with a high standard of workmanship and quality, on strict schedule, and within the budget, in accordance with the specifications and drawings of the RFQ, to acceptable environmental and social standards and in accordance with prudent engineering practice.

The objectives of the services will be achieved through the following major activities:

1. Designs and Documents Review;
2. Supporting Contract Management; and
3. Construction Supervision, Commissioning, and Acceptance Testing Services.

The Owners Engineer is expected to:

- Be on site at least twice a month to monitor the progress made in relation to the implementation of and its full adherence with the RFQ, the quality of construction, installation of mechanical engineering and electrical systems;
- Regularly brief and consult with solutions with the Project Committee on the status and progress made;
- Review and confirm quality assurance program of the Contractor;
- Review and confirm the delivery of material to the site;

- Review and clear construction drawings, schedules and process proposed by the Contractor;
- Review and confirm quantity and quality of works completed, which would serve as a basis for payment to the Contractor according to the Contract terms;
- Hold regular meetings with the Contractor to review project progress, technical issues, and measures to achieve the targeted cost, quality and schedule control;
- Review and confirm the acceptance test proposals made by the Contractor and support the Contractor in completing the acceptance test;
- Review and confirm the Contractor O&M Manual, including training program for CHDM, DRPW selected officials
- Providing additional technical support to the SAWEP PCU as needed for successful implementation of the RFQ;
- Supervise the installation of the electrical and mechanical equipment in a satisfactory and safe manner in accordance with the specifications and contract requirements;
- Review the construction drawings for the civil and electrical works of the contracts. The construction drawings shall clearly impart the final design of the works, and shall be revised and supplemented to meet field conditions as the works progress;
- Check and approve the relevant reports, which shall be in a format agreed with the SAWEP PCU;
- Supervising the commissioning of all structures and plant on the Project;
- Measurement and verification of work quantities and certification of Contractor's invoices for approval and release of payments;
- Make recommendations to the SAWEP PCU regarding settlement of claims by the Contractor;
- Prepare items of work to be completed by the Contractor during Maintenance/Defects Liability Period
- Prepare a "Completion and Handover Report" for the works under the contract, including a summary of final costs;

Project Program

Within 10 days of awarding the RFQ Turnkey contract, the Owners Engineer shall prepare, and submit to the Project Committee for consent, a detailed Project Program of all of the activities related to the execution of the RFQ. The Project Program shall be based on the reviewed and accepted program of the Turnkey contractor and shall include all activities that interface or otherwise relate to the work being done by the Turnkey Contractor.

When this program has been approved by the SAWEP PCU, it shall become the new baseline program for monitoring the execution of the RFQ (the progress monitoring with milestones) and shall not be modified or revised by the Owner's Engineer without the prior consent of the SAWEP PCU.

Handover

Once the works have been completed and commissioned, they will be handed over to the CHDM, DRPW as an asset for operation and maintenance. As such, the Owners Engineer will be required to develop and manage the hand-over process, including all technical, statutory, oversight and intergovernmental requirements and the supervision of resolution of possible defects found during the acceptance tests.

Reporting

The Owners Engineer shall check and approve the Turnkey Contractor reports, which shall be in a format agreed with the SAWEP PCU

The Owners Engineer bi weekly report shall be coordinated with the requirements set forth in "Project Program" to include submission of the following:

- Cumulative expenditure record and estimated cost at completion of each item, Variation Order and claim for the Contracts on construction, equipment, and consulting services;
- Record of Variation Orders issued and being prepared; and
- Claims received, under consideration and settled.
- Technical reports on instrumentation monitoring or similar construction performance
- Provide any special reports as requested by the SAWEP PCU.

4.6 Coordination and Project Management support: Groundwater Assessment, Borehole Drilling and Groundwater Management contract

Support, in parallel with 4.4 and 4.5, the SAWEP PCU with coordination and project management of the Groundwater Assessment, Borehole Drilling and Groundwater Management contract Executing plan and progress reporting which is a separate contract and implemented in parallel with Phase 2. Two site visits by the consultant are envisaged for 4.6 in support of the SAWEP PCU, one site visit during the Groundwater Assessment implementation and to coincide with the design of the small scale wind water pumping RFQ site visit and second during the borehole drilling and groundwater management implementation.

5. DELIVERABLES

Deliverable	Description, Content	Time frame*	%*
PHASE 1			
Deliverable 1: Inception Report	Attend an inception briefing meeting, and thereafter produce an Inception Report detailing the agreed methodology, work plan and timeline of activities, and related specific details.	Within 10 days after inception briefing	20
Deliverable 2: Focused Techno- economic study report with recommendations, Final School List	4.2 Undertake a techno-economic assessment, making use of appropriate economic tool(s) to determine the least cost option and operation and maintenance costs between solar PV and wind (electrical) water pumping systems for the schools comprising the School Working List 4.1. 4.2 Present the techno-economic study and findings to the Project Committee that will inform the Candidate School List. 4.3 Support the Project Committee with the final selection of maximum two schools from the Candidate School List that will inform the Final School List	40	30
PHASE 2			
Deliverable 3: Design and compile a RFQ for tender: small scale wind (electric) water pumping, Support the tender process, technical evaluation	4.4 Design and compile in UNDP format for the two schools, comprising the Final Schools List, a RFQ: Turnkey Small scale wind water pumping system, including civil and electric works, O&M and Capacity building that is based on the outcome of the techno economic study and groundwater assessment (borehole depth, yield) (separate contract).	50	30
Deliverable 4: Project Program & by-weekly reporting, SAWEP PCU project management support of Groundwater Assessment, Borehole Drilling and Groundwater Management contract	4.5 Within 10 days of awarding RFQ contract, the Owners Engineer shall prepare, and submit to the Project Committee for consent, a detailed Project Program. Bi weekly reporting according to the Project program. 4.6 Support SAWEP PCU with project management of the Groundwater Assessment, Borehole Drilling and Groundwater Management Project Executing plan and progress reporting	45	10
Deliverable 5: Handover and defects resolution report	4.5 Once the works have been completed and commissioned, they will be handed over to the CHDM, DRPW as an asset for operation and maintenance and M&E.	5	10

*indicative to be confirmed at contract signature

6. CONTRACT PERIOD AND EFFORT REQUIRED

The project is to be completed within 5 to maximum 6 months of contract signature (maximum 2 months Phase 1, 4 months Phase 2)

7. MINIMUM REQUIREMENTS

- A suitably Degreed Engineer (Civil or Mechanical or Electrical);
- Professional Engineering Certification with the Engineering Council of South Africa, and adequate professional liability insurance;
- Documented experience, knowledge and proven track record undertaken similar projects (economic assessment, modelling) and size, preferably wind energy;

- Documented experience, knowledge and proven track record undertaken similar projects (design, drawing up specifications, owners engineer) and size, preferably wind energy
- Fluency in English;
- Experience in professional communication and reporting at all levels.

8. PROJECT ADMINISTRATION

Whilst the contract is held with UNDP, the work will be overseen by the SAWEP Project Coordination Unit (PCU) comprising of the Project Manager (SANEDI) and DMRE Renewable Energy Initiatives Project Manager.

9. EVALUATION CRITERIA

The evaluation of proposals will be conducted according to UNDP procurement rules. A two-stage procedure is utilised in evaluating the proposals, with evaluation of the technical proposal being completed prior to any price proposal being opened and compared. The price proposal of the proposals will be opened only for submissions that passed the minimum technical score of 70% of the obtainable score of 100 points in the evaluation of the technical proposals. The technical proposal is evaluated on the basis of its responsiveness to the Term of Reference (TOR) and candidates may be requested to make a presentation to the Technical Evaluation committee. In the Second Stage, the price proposal of all contractors, who have attained a minimum of 70% score in the technical evaluation will be compared.

Selection will be based on a technically qualified proposal with lowest quoted financial proposal, where the approach to the work, qualifications and experience (Technical proposal) will be weighted to a maximum of 70%, and the price offer (Financial proposal) which will be weighted at a maximum of 30%.

Technical Evaluation Criteria

Evaluation criteria	Max score
Proposed Methodology (A clear methodology. The methodology must outline how the Scope of Work will be carried out according to each deliverable with an understanding of the assignment).	30
Proposed Work Plan (Detailed work plan with milestones, timelines and resources and designated responsibilities of the consultant and any support members must be indicated in the proposal for achieving of the deliverables).	30
Documented experience, knowledge and proven track record undertaken similar projects (economic assessment, modelling) and size, preferably wind energy 8 and more yrs = 20 6 to 8 yrs = 18 4 to 6 yrs = 16 2 to 4 yrs = 14	20
Qualifications Degreed Engineer (Civil or Mechanical or Electrical) Professional Engineering Certification with the Engineering Council of South Africa, and adequate professional liability insurance. B.Eng. M.Sc. and higher = 10 B.Eng. = 8	10
Experience in professional communication at workshops and stakeholder consultations	10

10. RESPONSE FORMAT

To facilitate the analysis of responses, all interested parties are required to prepare their response in accordance with the instructions outlined in this section. All proposals should be electronically generated. The vendor will be hired on a UNDP contract.

Applicants are required to submit the following:

- A Technical Proposal: Letter of Interest, stating why you consider your service suitable for

the assignment and a brief methodology on the approach and implementation of the assignment;

- Evidence and examples of similar projects that have been successfully completed;
- Personal CV highlighting qualifications and experience in similar projects;
- Work references – minimum of 3 references - contact details (e-mail addresses) of referees (organisation for whom you've produced similar assignments);
- All-inclusive financial proposal indicating consultancy fee (South African Rand) and a breakdown of expenses (unit price together with any other expenses) related to the assignment. The proposal must incorporate all the costs including travel etc. for the service provider to achieve the required deliverables.

Applicants are required to submit the following documents to bid.pretoria@undp.org on or before the **27th November 2020** with the subject line: **Job Code Title and Reference Number**.

11. CONTACT PERSON

For any enquiries regarding this call for proposal, contact the UNDP procurement.enquiries.za@undp.org / lerato.maimela@undp.org