

REQUEST FOR QUOTATION

SENTECH INVITES SUPPLIERS FOR:

Project title:	<i>Appointment of a service provider for the Design, Supply, and installation of a functional Ground Mount Photovoltaic system at the George transmission site</i>		
Quotation or Proposal no:	1000002022		
RFQ Issue date:	27/02/2023		
Briefing session date, time, and venue	01 March 2023 @ 43 Akasia Street George		
Briefing session Time	10:00		
Closing date:	10 March 2023		
Closing time:	12h00	Validity period:	30 days

You are invited to provide a quote to deliver the goods, services or works defined in the Scope of Work.

QUOTATIONS OR PROPOSALS TO BE RETURNED TO:

Quotations Administrator	Zanele Zulu
Telephone no:	044 871 0981
E-mail:	Quotations6@sentech.co.za

Form of Offer and Acceptance

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the services as stated in the RFQ: Scope of Work

The Service Providers, identified in the Offer signature block, has examined the documents listed in the RFQ and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of this RFQ.

By the representative of the Service Provider, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the Service Provider offers to perform all of the obligations and liabilities of the RFQ under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the RFQ.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VAT IS:

(in words)

.....Rand;

R.....(in figures)

THE OFFERED PRICES ARE AS STATED IN THE PRICING SCHEDULE

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the Service Provider before the end of the period of validity stated in the RFQ, or other period as agreed.

Signature(s)

Name(s)

Capacity

For the tenderer:

(Insert name and address of organisation)

Name & signature of witness

Date

Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the Service Providers Offer. In consideration thereof, the Employer shall pay the Service Provider the amount due in accordance with the conditions of the RFQ. Acceptance of the Service Providers Offer shall form an agreement between the Employer and the Service Provider upon the terms and conditions contained in this RFQ.

Deviations from and amendments to the documents listed in the RFQ and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the Service Provider and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The Service Provider shall within two days of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the RFQ. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the Service Provider receives one fully completed original copy of this document, including the Schedule of Deviations (if any).

Signature(s)

Name(s)

Capacity

for the Employer

(Insert name and address of organisation)

Name & signature of witness

Date

RFQ Data

1. ADMINISTRATIVE RESPONSIVENESS CRITERIA

- 1.1. Suppliers are required to ensure that they meet all the Administrative Responsiveness Criteria. Suppliers that do not meet all the Administrative Responsive Criteria may not be awarded this Quote. It is the service provider's responsibility to ensure that they are tax compliant and that all required information is submitted to Sentech. Supplier's providing quotations must be registered on the Sentech Supplier Database.
- 1.2. **Quotations must be in a Company Letterhead.**
- 1.3. Quotations or Proposals must be received on or before the closing date and time specified on the Call for Quotation or Proposal document.
- 1.4. Quotations or Proposals must be fully completed and signed in BLACK ink.
- 1.5. Quotations must be submitted via Email.
- 1.6. The Tenderer undertakes to the Purchaser that it will treat as confidential the terms of this RFQ together with all the Purchaser's confidential information and will not disclose such confidential information to any person, firm or company (other than to its auditors and other professional advisers) or to the media, and will not use such confidential information other than for the purposes of this RFQ, subject always to any prior specific authorisation in writing by the Purchaser to such disclosure or use."

2. EVALUATION CRITERIA

The evaluation criteria are stipulated in Section 5. It is the Suppliers responsibility to ensure that it has responded to the evaluation criteria. Failure to meet the evaluation criteria may result in the Supplier being disqualified from being appointed. Suppliers must ensure that they have included all supporting documentation, especially the documentation that may be required to support the response to the evaluation criteria.

3. BRIEFING SESSION

N/A

4. RFQ EVALUATION METHOD

This RFQ will be evaluated as described in the table below.

Evaluation Method	
	<ol style="list-style-type: none"> 1. Stage 1 – Administrative Responsiveness Evaluation All the Quotations will be evaluated against the Administrative responsiveness requirements as set out in section 2 of the RFQ Data. 2. Stage 2 – Functional Evaluation Criteria The proposals that COMPLY with the Mandatory evaluation criteria be evaluated against the Functional Criteria. Suppliers meeting the minimum requirement will be evaluated further. 3. Stage 3 – Price and Preference Suppliers with the lowest Price offered will score the highest points. Only Suppliers that submit a valid B-BBEE Certificate can claim preference points in line with the 80/20 Suppliers with the highest number of points will be recommended for the award of this quotation, unless there are compelling and justifiable reasons not to do so.

5. Evaluation of Price and Preference

The Service Provider will be evaluated on a points system for Price and Preference as per Preferential Procurement Framework Act of 2000 (Act 5 of 2000).

6. TECHNICAL EVALUATION CRITERIA

1. EVALUATION CRITERIA

5.1 Local Content Verification (Stage 1)

Local Content Criteria	DTi Local Content Threshold	Compliant (Indicate Yes or No)	What Proof is required to show compliance to Mandatory Eligibility Criteria
Laminated PV Modules	15%		SBD6.2 and Applicable Annexures / OR Exemption Certificate from DTi
Module Frames	65%		SBD6.2 and Applicable Annexures / OR Exemption Certificate from DTi
DC Combiner Boxes	65%		SBD6.2 and Applicable Annexures / OR Exemption Certificate from DTi
Mounting Structure	90%		SBD6.2 and Applicable Annexures / OR Exemption Certificate from DTi
Inverter	40%		SBD6.2 and Applicable Annexures / OR Exemption Certificate from DTi
NOTE: Bidders are urged to complete SBD 6.2 and all applicable annexures or get exemption certificate from DTi.			

Mandatory Eligibility Criteria	Compliant (Indicate Yes or No)	What Proof is required to show compliance to Mandatory Eligibility Criteria	Reference proof supplied by reference the page number where the information is located in your Tender submission
1. Fully Complete the compulsory covering FORM		Annexure 1	
2. PV module supplied must be Tier 1		Proof that the PV module supplied is a Tier 1.	
3. Inverter supplied must be of a known type: SMA, Kaco, Solar Edge, similar/equivalent – or approved. The following minimum certifications need to apply: (IEC61727, IEC62109-1/2, NRS 097-2-1 2017, IEE1547, IEE1547.1, IEE1547.2)		Certificate of Compliance	
5. PV modules need to be fixed by means of anti-theft fixings		Data Sheet and Design Drawing	
6. Electrician must be registered with department of labour as a three-phase electrician (IE/MIE Number)		Registration proof to be supplied (.i.e. Three(3) Phase Wireman's Licence). Expired	

Mandatory Eligibility Criteria	Compliant (Indicate Yes or No)	What Proof is required to show compliance to Mandatory Eligibility Criteria	Reference proof supplied by reference the page number where the information is located in your Tender submission
		licences won't be accepted.	
7. Contractor needs a CIDB rating of 2EP or better		Proof to be supplied (i.e. Valid CIDB registration to be supplied)	
8. Proof of ECSA Registered Professional Engineer or Technologist		Attach a valid ECSA certificate for the registered professional	
NOTE: Bidders that do not comply with all the above criteria will not be evaluated further.			

6.1 Functional / Quality criteria (if applicable)

Applicable for acquisitions between R 15 000 and R 1 million and if no Functional Criteria, indicate "N/A"

	Evaluation scoring criteria based on compulsory covering sheet submitted	Maximum allowable points	Points allocation	Proof Required
1	Company experience in years	10	Less than 5 years = 1; 5 years-10 years = 5; More than 10 years = 10	Please include a mix of project references from the oldest projects to newest projects
2	Company combined installed capacity (kWp)	10	Less than 200kWp = 1 200kWp - 1MWp = 5 Above 1MWp = 10	Attach project reference sheet with details of installed capacity per client/customer.
3	Number of completed rooftop systems	20	0=0; 5=5pts; 5-10=10pts; More than 10=20pts	References required for Rooftop systems
4	Project timeline (Calendar Weeks) from appointment to handover	10	Sliding scale. $\{(40-x)/(40-15)*10\}$ Base duration of 15 weeks and max duration of 40 weeks	Project plan to be submitted
5	Number of installations (greater than 18kWp)	10	Less than 10 = 1 10-20 =5 More than 20 = 10	Team leader CV should address the

	Evaluation scoring criteria based on compulsory covering sheet submitted	Maximum allowable points	Points allocation	Proof Required
	delivered by the team leader for this project.			said installations together with reference contact details
6	Team leader relevant experience (years)	20	Less than 5years = 1 5 years – 10 years = 10 More than 10 years = 20	Team leader CV needs to reflect number of years and experience together with contact details
			The pass mark for further evaluation is 55 or more out of 80 points. Any points scored lower than the pass mark will render the submission disqualified. A bidder must score in each and every item to be evaluated further. If one item a bidder gets zero, they will be disqualified.	
	Total	80		

6.2 Technical Evaluation (Stage 4)

	Item Description	Score	Comments	Proof required
1	Stage 4 – Technical evaluation based on Annexure 2 - Returnables and submitted drawings/specification sheets	<u>1. If 85-90% of the sheet is complete = 30 points</u> <u>2. Between 90-95% = 40 points</u> <u>3. More than 95% = 50 points</u>		
		50		
2	Design			
2				
1	Design detail [50]			
a	Lightning protection design evidence:	2		
	-Design drawing of site layout showing finials/masts		If drawing is submitted full marks, No Drawing-0	Submit Drawings
	-Design drawing of site layout showing bonding to the proposed earth ring/mat		If drawing is submitted full marks, No Drawing-0	Submit Drawings

	Item Description	Score	Comments	Proof required
b	PV panel site layout	1	If drawing is submitted full marks, No Drawing-0	Submit Drawings
c	System~18kWp AC=15kVA	2	Determined from PV panel Site layout. If 18kWp full marks	Submit Drawings
d	Monthly energy yield simulations	3	If drawing is submitted full marks, No Drawing-0	Submit Drawings
e	Monitoring schematic	2	If drawing is submitted full marks, No Drawing-0	Submit Drawings
		<u>10</u>		
2 2	PV Module [10]			
a	Module efficiency	4	Module efficiency taken from Spec sheet. $(x-15)/(19-15)*4$; If spec sheet is not submitted = 0	Attach spec sheet
b	Certifications	2	PV Cycle, TUV Rheinland, CE, MCS. All 4 needs to be specified to get full marks. If one is missing, then = 0	Attach spec sheet
c	Product warranty	2	Above 12year product (2); 10 - 11, year product (1,5); 5 -9 year product (0.1)	Attach spec sheet from Manufacturer
d	Output Performance warranty	2	Equal to or above 25 year perf. (2); 15 - 24 year perf. (1.5); 10 -14 year perf (0.1)	Attach spec sheet from Manufacturer
		<u>10</u>		
2 3	Inverter [10]			
a	European efficiency	4,5	Inverter efficiency taken from Spec sheet. $(x-98)/(100-98)*4,5$; If spec sheet is not submitted = 0	Attach spec sheet

RISK ASSESSMENT (Stage 5)

All bids that meet the minimum qualifying score for technical evaluation may undergo a risk assessment based on the following framework:

- Any aspects that emanate from the bidders' individual responses
- Any information received from past references
- Site Visit of similar work done
- Assessment of Financial Statements

Sentech may disqualify bidders based on the outcome of the risk assessment.

Scope Of Work

1. TECHNICAL REQUIREMENTS

1.1. Glossary of Terms

SYMBOLS AND ABBREVIATIONS

Throughout the documentation units of measurement are referred to by symbols: Abbreviations used:

Alternating Current	: AC
British Standard	: BS
Certificate of Compliance	: COC
Contract Price Adjustment	: CPA
Control and Management System	: CMS
Direct Current	: DC
Distribution Board	: DB
Environmental Impact Assessment	: EIA
International Electro-Technical Commission	: IEC
Ingress Protection	: IP
Kilo Volt-Ampere	: kVA
Low Voltage	: LV
Miniature Circuit Breaker	: MCB
Medium Voltage	: MV
New Registration System	: NRS
Point of Connection	: POC
PolyVinyl Chloride	: PVC
South African National Standards	: SANS
Steel Wire armoured	: SWA
The Main Contractor on Site	: Main Contractor
The contractor responsible for the electrical installation on site	: Electrical contractor

2. SCOPE OF WORKS

The scope of this project is for the appointment of a service provider to design, supply, install and commission a functional Rooftop Photovoltaic system at Vryheid Transmitter Station. The identified site is to have a 18kWp, 15kVA AC solar power without losses.

The project entails the following works:

- A recommendation as to the best location and orientation for the PV array, must be included in the submission. The reasoning behind these recommendations must be included.
- Pricing for a Rooftop tilted, [with two panel portrait per structure], must be provided for.
- Calculation of power saving annually.
- Calculation of annual payback based on current tariffs and proposed 10% increases for 2023, 2024, 2025, 2026 and 12% thereafter.
- Calculation of payback period based on the tariff sheet.
- SMA grid connected inverters or approved similar to be used.

Rooftop installations

The array shall be installed on structures suitably sized for the array output required and the given area available. The structures must be designed and orientated as to achieve the maximum yield which will in turn provide the client with the quickest payback period. It is the contractor's responsibility to do a proper study to determine what the roof conditions are for securing the structure for the roof. Any additional civil costs required due to a lack of research on the roof conditions shall be for the contractor's account. Ballasted solutions will be the very last option to be considered. The installation must be secure.

A drawn design of the fixing detail of the structure to shall accompany this RFP.

Array

The system's photovoltaic array shall provide a peak (DC) power at Standard Test Conditions. The array by a combination of modular panels shall produce electrical power to supply the buildings during

peak sun hours. Peak sun hours are the equivalent number of hours per day when solar irradiance averages 1 kW/m².

The array is to be optimally orientated and sized to achieve an average of five and a half (5.5) peak sun hours per day averaged over the year. Array efficiency is of paramount importance - inefficient array layouts that do not maximise solar exposure, [are subject to shading and less than 5.5 peak sun hours per day over the year], will not be considered.

The system needs to be sized to **18 kWp power give or take 1kWp and 15kVA AC power**. The way to achieve this is left up to the discretion of the contractor preparing the solution. Panel performance depreciation over time also needs to be considered in the proposed solution. Drawings will be supplied to the contractor in order to prepare a panel layout. Co-ordinates will also be also provided.

The proposed panel needs to be able to withstand normal weather conditions such as UV radiation, temperature, humidity, hail, snow and wind pressure. Testing details of the panel under various weather conditions need to be provided in accordance with IEC 61646. The proposed panel needs to be able to withstand a minimum hail diameter of 25mm, (7.53 g), but preferably 45 mm, (43.9 g)

Irrespective the type of installation, roof or ground, the support structures shall be light-weight in materials and design; evidence of this must be supplied. The PV array shall be installed to allow proper run off and drainage and avoid dirt accumulation. The abovementioned support structure will have to be approved by the appointed Structural Engineer.

The system is to include electrical terminal and combiner boxes, quick-connect electrical connectors, DC wiring, DC disconnects, grid-connected inverters, AC disconnect and a corresponding Supervisory Control and Data Acquisition (SCADA) system. The inverters shall be wired to the electrical system through a suitable circuit breaker compliant to NRS 097-2-1 NS protection. The inverters shall be guaranteed for a minimum of five [5] years, but offers to extend it to 10 and 15 years must be provided. The Solar contractor shall endeavour throughout the project to ensure safety and appropriate compliances.

PV Modules

PV Modules shall be tier 1 and shall provide the maximum power production per meter squared (m²).

The Contractor shall supply and install the PV modules to achieve the specified levels of performance for the required design life of 25 years under the prevailing site environmental conditions, which shall be determined by the Contractor.

Modules to be used shall be reliable modules with a proven track record in performance, operation and obtaining long-term debt (project finance). The Contractor shall ensure that PV modules are sourced from a Tier 1 manufacturer.

All modules supplied shall be of the same type and from a single manufacturer.

The quality of equipment supplied shall be generally controlled to meet the guidelines for the design included in the standards and codes listed.

All transportation, storage, handling and installation of the modules shall be in accordance with the specifications from the manufacturer to ensure that the module manufacturer's warranty is honoured. The module rated peak power shall be used to determine the peak power of the PV Plant. The peak power shall be the sum of the manufacturer's name plate data sheets for each individual module.

The Contractor shall be responsible to decide the module arrangements to minimise the losses due to mismatching. Where the manufacturer's module flasher data show an IMPP deviation of more than 3%, PV modules shall be sorted into three groups to meet a set tolerance. Only modules from the same set shall be used in in the same string. All records of the testing and grouping of Modules must be kept and presented to the Clients.

Inverters

Inverters shall be string inverters and have a NRS 097-2-1 (2017) inverter compliance certificate from a third-party test institute.

The Contractor shall provide inverter arrangement for the PV Plant that is selected to give overall optimal energy yield from the PV Plant over the life of the Contract Period, taking into account the site conditions, the proposed module layouts, shading and orientations.
The inverters shall be installed in a manner that it is not exposed to direct sunlight.

Inverters shall meet the following general requirements:

Due to maintenance reasons and a conservative spare-part approach, inverters of the same type and size from the same manufacturer shall be deployed.

Inverters shall be equipped with communication capabilities as required by the Control and Monitoring System (CMS); all inverters shall be able to be controlled / supervised by the same software or CMS system.

Software must be paid for or free access for the Client for the lifetime of the plant.

Inverter specifications shall be selected with respect to the local climatic and environmental conditions. The inverters shall be suitable for inland installation and operation in conditions such as extreme heat and dust.

Inverters to be used shall be reliable inverters with a proven track record in performance, operation and obtaining long-term debt (project finance). The manufacturer shall be established in the market.

Inverters must comply with applicable norms and standards including but not limited to NRS-097-2-1:2017. The test result and certification must be attached to Returnable Technical Schedule, Inverters shall comply with South Africa Grid Code requirements for renewables.

The Contractor shall submit calculations for ensuring electrical compatibility between the inverters and the modules selected including, selection of appropriate inverter dimensioning factor and ensuring system voltages lie within acceptable MPPT ranges across the range of operating conditions for the Site.

The quality of equipment supplied shall be generally controlled to meet the guidelines for the design included in the standards and codes listed.

All transportation, storage, handling and installation of the inverters shall be in accordance with the specifications from the manufacturer to ensure that the manufacturer's warranty is honoured.

The Contractor will be required to confirm the inverter manufacturer's warranties for the given environment and installation type. The Contractor shall also mention if the inverter warranties can be extended.

The Contractor is required to install a motorised circuit breaker.

The motorised circuit breaker shall have the following features:

- over and under voltage;
- over and under frequency;
- voltage vector shift; and
- rate of change of frequency (ROCOF).

The protection relays used shall comply with the relevant sections of the international standard for protection relays IEC60255.

The inverters to be used shall be SMA grid-connected inverters or approved similar.

Earthing

The Contractor shall design, supply and install an earthing system for the PV Plant that eliminates the risk to personnel of electric shock under normal operating conditions as well as fault conditions. Furthermore, the earthing system shall ensure the functionality of electrical protection equipment during electrical faults.

The Contractor shall design the earthing system in accordance with Solar PV industry best practice and in compliance with SANS Codes.

The bidder shall provide an earthing proposal including but not limited to:

- A project specific earthing system diagram;
- Data sheets of main products used;
- Proposed test procedure.
- The Contractor shall conduct tests on the earthing system to fully verify and certify the safety of the site.

The AC Distribution Board shall be bonded to the earthing system with a bare Cu earth conductor. Protective earthing or bonding conductors connected to the main earthing system shall be provided for the array frames.

Surge and lightning protection

The Contractor shall carry out a risk assessment for lightning and install adequate lightning protection systems.

The Contractor shall design the lightning protection system in accordance with the latest edition of the SANS/IEC standards.

The lightning protection system shall protect the plant, inverters, control and monitoring systems and any other electrical and mechanical equipment against damage caused by lightning strikes.

The proposals to the Client must provide for adequate design against lightning induced overvoltage risk.

Overvoltage protection shall be installed at DC side as well as AC side of the inverter and within the PV arrays.

In general, the design of the DC system must ensure that cables are kept in parallel and as short as possible, while cable loops are also avoided or restricted.

Protection against direct strikes (direct strike lightning protection) shall be installed and coupling because of strikes elsewhere in the grid (indirect strike lightning protection) shall be taken into consideration and designed out of the system.

The lightning and surge protection shall meet the following criteria:

Lightning protection level (LPL 1 or 2)

Type 1:

Type: Modular, 1+2 Combined Lightning & Surge Arrester

Rating: $I_{total} = 100\text{kA}$ (10/350 μs), $U_p \leq 1.5\text{kV}$

Fuse: (Internal/Integrated) or external

Configuration: 3-phase = 3+1 configuration, or 1-phase = 1+1 configuration

Indication: Remote Signalling & Flag indication between (L-N, N-PE)

Technology: Spark-gap or equivalent

Follow current extinguishing capability [L-N]/[N-PE] (Ifi): 50 kA rms/100 A rms

Compliance : SANS/IEC 61643-11

Proven energy coordination with downstream arresters and terminal equipment

Lightning protection level (LPL 3 or 4)

Type 1:

Type: 1+2 Combined Lightning & Surge Arrester

Rating: $I_{total} = 50\text{kA}$ (10/350 μs), $U_p \leq 1.5\text{kV}$

Fuse: (Internal/Integrated) or external

Configuration: 3-phase = 3+1 configuration, or 1-phase = 1+1 configuration

Indication: Remote Signalling & Flag indication between (L-N, N-PE)

Technology: Spark-gap or equivalent

Follow current extinguishing capability [L-N]/[N-PE] (Ifi): 25 kA rms/100 A rms

Compliance : SANS/IEC 61643-11

Proven energy coordination with downstream arresters and terminal equipment

Sub AC distribution board

Type 2:

Type: Modular Type 2, Surge Arrester

Rating: $I_n = 20\text{kA}$ (8/20s), $U_p \leq 1.5\text{kV}$

Lightning impulse current (10/350 μs) [N-PE] (Iimp): 12 kA

Fuse: 125A gL/gG (External)

Configuration: 3-phase = 3+1 configuration, or 1-phase = 1+1 configuration

Indication: Remote Signalling & Flag (L-N, N-PE)

Technology: Spark-gap or equivalent

Short-circuit withstand capability for max. mains-side overcurrent protection (ISCCR): 50 kA rms

Compliance : SANS/IEC 61643-11

Energy coordination with upstream and downstream arresters and terminal equipment

DC SPD

Type:1

1+2 Combined Lightning & Surge Arrester

Total discharge current (10/350 μs) [DC+/DC- -> PE] (I_{total}): 12.5 kA

Voltage protection level [(DC+/DC-) -> PE] (UP): 2.5 kV (1000V DC)

Voltage protection level [DC+ -> DC-] (UP): 4.75 kV (1000V DC)

Short-circuit current rating (ISCPV): 1000 A

Indication:	Remote Signalling & Flag indication
Compliance :	EN 50539-11
Technology:	Y - configuration combined disconnection
and short-circuiting device with safe electrical isolation	
Energy coordination with terminal equipment (≤ 10 m)	
Type:2	Modular, 2 Surge Arrester
Total discharge current (8/20 μ s) [DC+/DC- -> PE] (I _{total}):	40 kA
Voltage protection level (UP):	≤ 4 kV (1000V DC)
Voltage protection level [DC+ -> DC-] (UP):	≤ 3.5 kV (1000V DC)
Short-circuit current rating (ISCPV):	10 KA
Indication:	Remote Signalling & Flag indication
Compliance :	EN 50539-11
Technology:	Y - configuration combined disconnection
and short-circuiting device with safe electrical isolation	
Energy coordination with terminal equipment (≤ 10 m).....	

Control and Monitoring System (CMS)

The following technical parameters are required to measure and monitor the plants:

- AC energy output at the point of supply (kWh);
- AC energy output from each inverter (kWh);
- Ambient air temperature ($^{\circ}$ C);
- Module temperature ($^{\circ}$ C);
- Global solar irradiation on plane of array (kWh/m²);
- Global solar irradiation on horizontal surface (kWh/m²).
- Wind speed (km/h)

A 24/7 metering and monitoring system are required, including the following:

- Web display with a content and functionality, similar or equally approved to SMA's "Webconnect";
- Weather station equipped with a pyranometer integrated with the web portal, similar or equally approved to SMA's "Meteo Station";

The display shall include the following minimum items:

- Current power in kW;
- Inverter comparison status;
- Energy for the current day and running total for the plant;
- Reimbursement;
- CO₂ avoided;
- Plant information, i.e. plant accumulated kWh to date and commissioning date;
- Current weather report;
- Graph with day, month, year and total options depicting the time and power (kW)
- Theoretical Maximum kWh production vs Actual Maximum kWh production.

Generator integration

The site is fully backed up by a generator in the event of a power failure. When a power failure occurs the PV system shall run in parallel with the generator in order to save diesel. The generator shall not run at less than 50% to 60% of its full load capacity in order to prevent carbonization. The PV system will need to be throttled accordingly in order to accomplish this.

General

The presence of voltage levels in the range of 300-600 V DC and beyond requires a very careful assessment of the protection and isolating devices.

The following forms of protection are to be taken into consideration during the design.

- Over current protection.

- Isolating devices on each string to allow this latter to be inspected or serviced without having to shut down other parts of the system.
- The exposed conductive parts of all the equipment must be earthed through the protection conductor with the aim to protect persons from indirect contacts.
- String protection against reverse currents.
- Earth fault protection.
- Grounding of the array.

Explanation as to how the above will be achieved will be by means of a protection philosophy schematic which must be included in the schematic.

A single-line electrical schematic is to be provided with the submission illustrating the system interconnections. This will illustrate the PV cell interconnections and how the PV array ties back into the domestic grid.

Detailed sizing calculations are to be included in the design submission. Design parameters and assumptions made are to be listed.

The Solar contractor will also train staff in the routine operation, maintenance and safety of the PV system, as well as the SCADA system.

The PV System is to be installed in a location that is not permanently manned. As a result theft is an issue at these remote sites. The contractor needs to allow for anti-theft means of fastening the panels to the structures as well as fastening the inverters to the structures

All cables (AC and DC) are to be buried and or enclosed as to prevent the cables from being stolen. ECC cables are to be used and they are to be accompanied by a separate insulated black earth cable.

Nominal system characteristics:

Voltage : **400V ± 5%**
Frequency : **50 Hz ± 0.1 Hz**

Technical information submission requirements:

Please refer to Returnables document

2.1. Information to Bidders

DRAWINGS/DOCUMENTS TO BE PROVIDED TO THE SUPPLIER

- site Layout
- tariff sheet
- Co-ordinates of Site
- main breaker size at POC
- Cable size at POC

6.4 RISK ASSESSMENT (Stage 5)

All bids that meet the minimum qualifying score for technical evaluation may undergo a risk assessment based on the following framework:

- Any aspects that emanate from the bidders' individual responses
- Any information received from past references
- Site Visit of similar work done
- Assessment of Financial Statements

Sentech may disqualify bidders based on the outcome of the risk assessment.

6.5 Evaluation of Price and Preference (Stage 6)

This Bid will be evaluated on a points system based on weighted average score for Price and Preference as per Preferential Procurement Framework Act of 2000 (Act 5 of 2000).

7. The price / preference weighting applicable for RFQ are as follows:

Price / Preference	Points
Preference:	20
Price:	80
Total must equal:	100

8. Preference Point allocation – 80/20

Sentech's Specific goals emanate from the section 2(1)d of the Preferential Procurement Policy Act which may include contracting with persons or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender and disability. The Reconstruction and Development Programme as published in Government Gazette No 16085 dated 23 November 1994

Sentech will award preference points as follows:

Goal	Points	Evidence required
Historically disadvantaged by unfair discrimination on the basis of Race	10	A valid BBBEE Certificate showing at least 51% black ownership
Historically disadvantaged by unfair discrimination on the basis of Gender (women)	8	A valid BBBEE Certificate showing at least 30% women ownership
Historically disadvantaged by unfair discrimination on the basis of disability	2	A doctor's note confirming disability
Total Points	20	

a. Price Calculation 80/20

The following formula will be used to calculate the points for price.

$$P_s = 80 \left[\frac{1 - (P_t - P_{min})}{P_{min}} \right]$$

Where:

P_s = Points scored for price of bid under consideration

Pt = Rand value of bid under consideration

Pmin = Rand value of lowest acceptable bid