

## TENDER DATA

<b>Project title:</b>	<b>Appointment of a Service Provider to Design, Supply and installation of a 180kWp functional ground mounted Photovoltaic system at Zeerust Transmitter Station.</b>
<b>Bid no:</b>	<b>SENT/022/2023-24</b>

### 1. BACKGROUND

Sentech is a state-owned company and is the largest broadcasting signal distributor in South Africa. Sentech is a licensed Electronic Communications Network Service provider in South Africa. It currently operates many telecommunication networks for Satellite, Television, Radio, Internet and more. As such, Sentech is a global enabler of broadcasting and digital content delivery.

In keeping with Sentech's environmental management policy and the climate change policy, Sentech commit to contribute to the reduction of climate change impacts and incorporate energy efficient strategies towards reducing their carbon footprint.

Sentech therefore intends to appoint a supplier who would design, supply and install a complete and functioning ground mounted photovoltaic system. This system would be monitored and maintained by the same supplier who installed it for a 12-month period after commissioning.

### 2. SUBMISSION OF BIDS and CLOSING

This Bid closes at the stipulated date and time as stated in SBD 1 Notice and Invitation to Bid. Bids must be submitted by hand to the Bid Administrator at SENTECH, Octave Road, Radiokop Ext 3, Honeydew, Johannesburg.

Bidders that choose to submit their bid documents before the closing date and time may do so during working hours only (08:30-15:30).

It is the Bidder's responsibility to ensure that their bid submissions reach the Bid Administrator before the bid closing time as no late submissions will be accepted.

Telegraphic, telephonic, telex, facsimile, e-mail and late Bids will not be accepted. Proposals may be opened in public. Bidders will be advised of the outcome by letter, facsimile or e-mail.

This is a two-envelope system for Bid Evaluation. Bidders must submit their proposal and all supporting documentation in a sealed envelope, clearly marked as follows:

**Envelope One** "Original Technical Proposal" and one "Copy of Technical Proposal" together with a soft copy in PDF format of an electronic medium e.g. USB etc. The soft copy will consist of a single PDF document containing the complete response. The envelope must contain all information and documents relating to the Bid. (Refer to list of returnable documents).

**No Financial Information must be included in Envelope 1.**

**Envelope Two** "Original Financial Proposal" (Contract Date and Pricing schedule/schedule of rates as applicable) together with 1 copy of "Financial Proposal" together with a soft copy in PDF format of an electronic medium e.g. Compact Disk (CD), USB etc. The soft copy will consist of a single PDF document containing the complete Financial Proposal.

Bidders are required to place the sealed **Envelope 1** together **with** the sealed **Envelope 2** into one sealed envelope or container. The sealed envelope or container must be marked with the following information:

- **For Attention**
- **HEAD OF SUPPLY CHAIN MANAGEMENT**
- **BID REFERENCE NO: SENT/022/2023-24**
- **TECHNICAL AND FINANCIAL PROPOSALS**

- **INSERT CLOSING DATE AND TIME**
- **BIDDER'S NAME AND ADDRESS**

Bidders that combine their Technical Proposal with the Financial Proposal (or any financial information) will be automatically disqualified and not be evaluated further.

The financial proposal will only be opened and evaluated should the technical proposal be found to be responsive, being that the technical proposal has met the minimum technical evaluation criteria that are set out in the Bid Documents.

The Bidders shall insert a table of contents and bind (ring bind or similar method) the proposal documents and verify the page numbers, as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Bidders are required to complete and sign all the returnable documentation (refer to list of returnable documents) and initial all pages, drawings and brochures which are included in the reply as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Late submissions will not be considered.

### **3. SIGN AND INITIAL**

Bidders are required to complete and sign the Bid Forms where required and initial the bottom of all pages, drawings and brochures which are included in the submission as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Only original signatures will be accepted.

### **4. COMPLETION OF BID DOCUMENTS**

Bidders must ensure that they complete all sections of the Bid Documents as per the requirements in the Bid.

Bidders must use only the Bid documents provided by Sentech. Photocopying of the Bid document is permitted however Bidders must not retype or redraft the Bid documents.

### **5. COSTS OF PREPARING THE BID SUBMISSION**

Bidders shall bear all costs associated with the preparation and submission of the proposals. Sentech shall under no circumstances be held responsible or liable for any costs incurred during the bidding process.

### **6. ADMINISTRATIVE RESPONSIVENESS CRITERIA**

Bidders are required to ensure that they meet all the Administrative Responsiveness Criteria.

### **7. BBBEE CODES AT SENTECH**

Sentech complies with the codes of good practice as prescribed by the DTI, to advance Broad Based Black Economic Empowerment.

### **8. Pre-qualification criteria**

With the objective of advancing designated groups, the Bidding condition applicable to this Bid is N/A (Specify targeted companies (EME / QSE) or minimum B-BBEE status level of contributor) as contemplated in PPPFA regulations, 2017 sub regulation 4(1). A Bidder must provide documentary evidence to support their compliance with this prequalification criteria. A Bidder that fails to meet any pre-qualifying criteria stipulated in this Bid document is an unacceptable Bid.

### 9. Subcontracting as a condition of Bid

The successful Bidder must subcontract a minimum of \_\_\_N/A\_\_\_% of the value of the contract to \_\_\_\_\_ (specify the designated group targeted) as contemplated in the PPPFA regulations, 2017 sub regulation 9(1);

### 10. Transformation Plan

A transformation plan is a record of activities an entity intends to undertake to improve its BBBEE Level through Ownership, Management and Control; Skills Development; Enterprise and Supplier Development and Socio-Economic Development.

Sentech reserves the right to request a BBBEE transformation plan with clearly defined timelines and milestones if the recommended Bidder does not meet Sentech's transformation goals. These milestones must be achieved over the term of the contract. This transformation plan must be submitted within 10 working days from the written request, failing which Sentech reserves the right to withdraw its appointment of the preferred recommended Bidder.

### 11. LOCAL PRODUCTION AND CONTENT

In the case of designated sectors, where in the award of Bids, local production and content is of critical importance, such Bids will contain a specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

Does this requirement fall under any designated sector as prescribed by the DTI?	Yes	No
If yes, specify the sector		
Specify minimum threshold applicable		

\*Bidders must fill in the SBD6.2 for Local Content and Production

### 12. EVALUATION CRITERIA

The evaluation criteria are stipulated in 18 below. It is the Bidder's responsibility to ensure that it has responded to the evaluation criteria. Failure to meet the evaluation criteria will result in the Bidder not being evaluated further. Bidders must ensure that they have included all supporting documentation required to support their response to the Bid.

### 13. BRIEFING SESSION

Should there be a compulsory briefing session for this Bid, Bidders must ensure that they attend the briefing session and sign the attendance register, as non-attendance or failure to sign the attendance register will automatically disqualify a Bidder from submitting a proposal for this Bid.

All questions raised by Bidders post the briefing session will be consolidated and shared with all Bidders at least seven (7) calendar days prior to closing.

### 14. CLARIFICATION

Enquiries related to Bid documents may be addressed to the Bid Administrator and Supply Chain Official as stated in SBD 1 Notice and Invitation to Bid.

## 15. BID EVALUATION METHOD

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

<p><b>An 80/20 system will be followed for Technical and Price offer.</b></p>	<ol style="list-style-type: none"> <li><b>1. Stage 1 – Administrative Responsiveness Evaluation</b> All the Technical Proposals will be evaluated against the Administrative responsiveness requirements as set out in the List of returnable documents.</li> <li><b>2. Stage 2 – Technical Evaluation</b> Mandatory Criteria: All Proposals that qualify based on the administrative responsiveness requirements will be evaluated against the Mandatory Evaluation Criteria Bidders must COMPLY TO ALL the Mandatory Evaluation Criteria in order to qualify for further evaluation. A compulsory covering FORM containing general information must also be completed as part of the Mandatory Criteria requirements</li> <li><b>3. Stage 3 - Functional Criteria:</b> Bidders qualifying in Mandatory criteria will be evaluated against the Functional Criteria. Bidders must score 55 points or more out of a total 80 points allocated. Bidders that score less than 55 points will not be evaluated further. Bidders who obtain the required threshold points of 55 points or more will qualify for further evaluation:</li> <li><b>4. Stage 4 – Technical Compliance</b> Bidders qualifying in Functional criteria will be evaluated against the Technical Criteria. Bidders must score 120 points or more out of a total 170 points allocated. Bidders that score less than 120 points will not be evaluated further. Bidders who obtain the required threshold points of 120 points or more will qualify for further evaluation:</li> <li><b>5. Stage 5 - Risk Assessment</b> Bidders that have qualified on the basis of achieving the required evaluation score may undergo a further risk assessment and can still be disqualified from being evaluated further should the risk assessment so warrant or there are compelling and justifiable reasons to disqualify a bidder. The risk assessment will be based on any identified risks that arise out of the bidder's responses and any other risks that Sentech may identify. A physical visit and survey of the bidder's or customer's premises may be requested, as deemed necessary. Assessment of Audited Financial Statements. Bidders that qualify based on the risk assessment will qualify for further evaluation</li> <li><b>6. Stage 6 – Price and Preference – 80/20 System</b> Financial Proposals for Qualifying Bidders will be opened and evaluated. Bidder's financial offers and BEE certificates will be ranked according to price and preference points from the highest number of points to the lowest.</li> </ol>
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## 16. ADMINISTRATIVE RESPONSIVENESS REQUIREMENTS

To be administratively responsive, Bidders must ensure that they meet all the below mentioned criteria. Bidders that do not meet all the below mentioned criteria may not qualify to be awarded the Bid. Sentech reserves its rights in respect of the below criteria.

- Complete and return all documentation stipulated in the LIST OF RETURNABLE DOCUMENTS.
- All correspondence must be in English.
- Bidders must fill in all sections of this document (where applicable).
- **BLACK INK** must be used when completing the Bid documents.
- Bidders must use only the Bid documents provided by Sentech. Photocopying of the Bid document is permitted however Bidders must not retype or redraft the Bid documents.
- All corrections must be initialled. The use of corrective fluid is strictly prohibited.
- Bidders are required to fill in and sign the Bid Forms and initial all pages, drawings and brochures which are included in the reply as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.
- Bidders must complete an attendance register at each compulsory site meeting attended.
- Appointment of a Bidder will be subject to signing, declaration and submission of SBD 1, 3.1, 3.2, 3.3, 4, 5, 6.1, 6.2 8, and 9 depending on applicability.
- Complete and sign the Contract Data.
- Should this be a 2 envelope or 2 stage system, Bidders **MUST** separate the technical proposal from their financial proposal. The technical and financial proposals must be placed in two separate sealed envelopes.

### 16.1 AUTOMATIC DISQUALIFICATION

Sentech reserves the right to automatically disqualify Bidders from being awarded this Bid. The following will lead to automatic disqualification:

- Failure to submit a financial proposal, if required.
- The Bidder is or has been involved in any act of corruption or fraud or bribery or collusion or attempt to influence any employee of Sentech to award this Bid or any other Bid to it.

## 17. TECHNICAL RESPONSIVENESS COMPLIANCE

The Technical Evaluation will encompass evaluation of:

- Mandatory Criteria
- Functional / Technical Criteria

## 18. TECHNICAL EVALUATION CRITERIA

### 18.1 Mandatory Eligibility Criteria

The following criteria are mandatory to ALL BIDDERS:

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)		Inverter must be certified by NRS and IEC and the Certificate of Compliance must be certified by NRS and IEC	
4. Mounting Structure proposed must be “GROUND MOUNTED” ONLY		Data Sheet and Design Drawing	
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 licences won't be accepted.	
7. Contractor needs a CIDB rating of 4EP 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. Annexure 1 to be fully completed. If not completed, bidders will be disqualified (i.e. Attached on this document.)**

**NOTE: Bidders that do not comply with all the above criteria will not be evaluated further.**

### 18.2 Functional Criteria

Please note : Some of the points allocation are in a sliding scale format. Points will be allocated based on what the bidder has submitted. X indicate the variable submitted by the bidder.

	Evaluation scoring criteria based on compulsory covering sheet submitted	Max allowable points	Points allocation	Proof Required
1	Company experience in years	10	Less than 1 year = 0 1-5 years = 1 pt; 6 years-10 years = 5 pts; More than 10 years = 10 pts	<b>Please include a mix of project references from the oldest projects to newest projects</b>
2	Company combined installed capacity (kWp)	10	Less than 500kWp = 1 pt 500kWp – 5MWp = 5 pts Above 5MWp = 10 pts	Attach project reference sheet with details of installed capacity per client/customer. NB: Indicate size/capacity.

	Evaluation scoring criteria based on compulsory covering sheet submitted	Max allowable points	Points allocation	Proof Required
3	Number of completed ground mounted systems	20	0=0 pt; 1=5pts; 2=10pts; More than 3=20pts	References required for ground mounted systems
4	Project timeline (Calendar Weeks) from appointment to handover	10	Sliding scale. $\{(40-x)/(40-15)*10\}$ x = proposed timelines in weeks. Base duration of 15 weeks and max duration of 40 weeks	Project implementation plan, committing to timelines to be submitted and clearly stated on the proposal.
5	Number of installations (greater than 180kWp) delivered by the team leader for this project.	10	Less than 5 = 1 pt 5 -10 =5 pts More than10 = 10 pts	Team leader CV should address the said installations together with reference contact details
6	Team leader relevant experience in PV Systems (years)	20	0=0 1- 5 years = 1 5 years – 10 years = 10 More than 10 years = 20	Team leader CV needs to reflect number of years and experience together with contactable references details
	<b>Total</b>	<b>80</b>	<b>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 automatically disqualified..</b>	

**Table 1: Functional Criteria**

Total minimum qualifying functional score is **55 points**. A Bidder must score **more than 0 points** in each criterion to be evaluated further.

### 18.3 Technical Evaluation Criteria

Please note : Some of the points allocation are in a sliding scale format. Points will be allocated based on what the bidder has submitted. X indicate the variable submitted by the bidder.

	Item Description	Score	Comments	Proof required
1	<b>Stage 4 – Technical evaluation</b> based on Annexure 2 - Returnables and submitted drawings/specification sheets	1. If 70-80% of the sheet is completed = 80 points 2. More than 80-90% = 90 points 3. More than 90%- 100 points		
		100		
2	<b>Concept Design</b>			
2.1	<b>Design detail [50]</b>			
a	Lightning protection design evidence:	2		
	-Design drawing of site layout showing finials/masts coverage		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
b	PV panel site layout	1	If drawing is submitted full marks, No Drawing-0	Submit Drawings
c	System ~ 180kWp AC=175kVA	4	Determined from PV panel Site layout. If 180kWp full marks	Submit Drawings



	Item Description	Score	Comments	Proof required
d	Walkways with adequate means of servicing PV modules	1	If highest panel is higher than 1,8m a description needs to be given of how to service that panel. Annexure 2 - returnables	Submit Drawings
e	Inclination	7	$0 < \text{incl} \leq 25^\circ (x/25 \times 7)$ ; $\text{incl} > 25^\circ$ (full marks) $x$ = angle of inclination submitted by the bidder.	Submit simulation
f	Azimuth	7	$\text{Azim} = 0^\circ (7)$ ; $0 < \text{Azim} \leq -22,5^\circ (4)$ ; $-22,5^\circ < \text{Azim} \leq -45^\circ (2)$ ; $\text{Azim} < -45^\circ (1)$	Submit simulation
g	PV support structure drawing	1	If drawing is submitted full marks, No Drawing-0	Submit Drawings
h	Monthly energy yield simulations	1	If drawing is submitted full marks, No Drawing-0	Submit Drawings
i	Monitoring schematic	1	If specification document is submitted, full marks, No Drawing-0	Submit Drawings
j	Specific Production (kWh P50/kWp)	25	$(x-1500)/(1950-1500) \times 25$ ; If $> 1950$ kWh/kWp (full marks) $x$ = specific production submitted by the bidder.	Submit Drawings
		<u>50</u>		
<b>2.2</b>	<b>PV Module [10]</b>			
a	Module efficiency	4	Module efficiency taken from Spec sheet. $(x-19)/(21-19) \times 4$ ; If spec sheet is not submitted = 0 $x$ = efficiency submitted by the bidder.	Attach spec sheet
b	Product warranty	4	Above 12 years product (2); 10 - 11, years product (1,5); 5 - 9 years product (0,1)	Attach spec sheet from Manufacturer
c	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>		
<b>2.3</b>	<b>Inverter [10]</b>			
a	European efficiency	4,5	Inverter efficiency taken from Spec sheet. $(x-98)/(100-98) \times 4,5$ ; If spec sheet is not submitted = 0 $x$ = efficiency submitted by the bidder.	Attach spec sheet
b	Submitted warranty	4,5	Above 5 years tendered (4,5); Equal to 5 years tendered (2); Less than 5 years tendered (0,1)	Attach spec sheet
c	IP rating	1	Above or equal 65 (1); 5x (0,2); Less than or equal to 4x (0,1)	Attach spec sheet indicating IP rating
		<u>10</u>		
	Total score	<u>170</u>	<b>The pass mark for further evaluation is 120 or more out of 170 points. Any points scored lower than the pass mark will render the submission disqualified.</b>	

**Table 2: Technical evaluation Criteria**

*Total minimum qualifying technical evaluation score is 120 points. Bidders that score below 120 points will not be evaluated further.*

## 19. Evaluation of Price and Preference

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).

### 20. Preference Point allocation – 80/20

Price / Preference	Weighting percentage
Preference:	20%
Price:	80 %
Total must equal:	100%

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)	6	A valid BBBEE Certificate showing at least 30% women ownership
Local production and content in line with the prescribed thresholds.	2	Fully completed SBD 6.2 with all annexures.
Historically disadvantaged by unfair discrimination on the basis of disability	2	A doctor's note confirming disability
<b>Total Points</b>	<b>20</b>	

### 20. 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  
 $P_t$  = Rand value of bid under consideration  
 $P_{min}$  = Rand value of lowest acceptable bid

## 22. Declaration of Authority

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this Bid Data is understood and all requirements will be adhered to.

Name of Bidder	Signature	Date	Designation



**TABLE 1: REFERENCES**

Please complete the customer reference table and relevant Contact telephone number and attach reference letters.

Customer	Service Provided	Contact Person	Contact tel. no.	Contractual commencement date	Contractual completion date
1					
2					
3					
4					
5					

<b>Name of Tenderer</b>	<b>Signature</b>	<b>Date</b>

## ANNEXURES

### 1. ANNEXURES

#### 1.1. Annexure 1 – Compulsory Cover Sheet (To be Completed)

1. Company Name:

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2. Main Contact person and contact details

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3. Company experience in PHOTO VOLTAICS (Years)

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4. Number of plants designed and fully installed. Also indicate the Energy Producing Capacity of each completed installation in (Watts i.e. KW, MW).

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5. Single biggest successfully installed PV system (kWp, Name, Value (R); year completed, Reference)

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6. Number of installations greater than >180kWp delivered by the proposed team for this project

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7. Successfully completed ground mounted PV system. (Not Carport or rooftop) (Size kWp, Location, Value R)

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8. Type of Modules proposed (Name, Size, Technology)

Name	
Size (kWp)	
Technology (poly, mono, thin film)	
Is it a Tier 1 panel	

9. Type of inverters proposed (Name, Size)

Name	
Size (kW)	
<b>Minimum Mandatory Certifications (Proof needs to be supplied in returnable)</b>	
	Tick if adhered to
IEC 62109-1/2	
IEC 61727	
NRS 097-2-1 (2017)	
IEEE 1547	
IEEE 1547.1	
IEEE 1547.2	

10. Type of Mounting structure (Is it ground mounted? Name, type of material)

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11. Size of Plant proposed (kWp & kVA AC)

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12. First year yield (P50 MWh and P90 MWh)

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13. Proposed monitoring system

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14. Installation/Project timeline (Calendar weeks including lead times)

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15. Leadtime of Modules

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16. Leadtime of Inverters

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17. Proposed anti-theft fixing measures (spec sheet to be included in returnables)

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18. Proposed solution to reduce the risk of veld fires damaging the PV plant (Small write up)

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19. Is the installation electrician a qualified three phase installation electrician? (Proof to be submitted in returnables)

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20. Electrical contractor must be registered with the CIDB and have a rating of 4EP or better. Please provide rating below. (Proof to be submitted in returnables)

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21. Battery type and warranty.

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## Annexure 2 – Compulsory returnables schedule (To be completed)

### STAFF AND COMPANY INFORMATION

Any information not declared below for which reason whatsoever might put the contractor at a disadvantage during adjudication stages

Address of Company		
Number of full time technical staff employed		
Number of full time technical staff to be assigned to the project		
Number of full time <b>South African</b> technical staff to be assigned to the project		
How long has your company been in the PV industry?		
<b>Company's first successfully installed PV system</b>		
Installed PV capacity [kWp]	Project Value	Reference
<b>Five large (&gt;180kWp) installations completed in the last 5 years</b>		
Installed PV capacity [kWp]	Project Value	Reference
<b>Three ground mounted installations completed (Not carports)</b>		
Installed PV capacity [kW]	Project Value	Reference
<b>Team Leader Details</b>		
Name:		
Team leader years' experience in PV		
Team leader number of installations >180kWp		

The project requires a high level of internal project management to interface to the Professional Project Team. Installation team shall be required to attend weekly site meetings.  
How do you intend to satisfy this requirement?

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## PROJECT PROGRAM

Please provide estimated start and completion dates for the project. Furthermore, provide a detailed installation programme.

Project milestone dates	
START DATE	
HANDOVER DATE	
DURATION - FROM LETTER OF INTENT TO HANDOVER (CALENDAR WEEKS)	

## INSTALLATION INFORMATION

**Specification sheet to be included.** If it is not included it might put the contractor at a disadvantage during adjudication stages

### Support structure

Support Structure (Specification sheet to be added)	
STRUCTURAL SHAPE (TUBULAR/ANGULAR STEEL)	
CORROSION PROTECTION AND UV PROTECTION	
WIND STABILITY OR MAXIMUM WIND SPEED (KM/H)	
WEIGHT PER M <sup>2</sup>	
INSTALLATION METHOD (EG: ASSEMBLED ON SITE, PRE-ASSEMBLED AND RIGGED INTO POSITION, ETC.)	
MODULAR OR STAND-ALONE SYSTEM (ARE THE SUPPORT STRUCTURES MODULAR, DO THEY CLIP TOGETHER OR IS SUPPORT STRUCTURE CUSTOM MADE, ETC.)	
DURABILITY AND LIFESPAN IN YEARS	
INCLINATION TO THE HORIZONTAL	
DIMENSIONS	
IF HIGHEST PART OF STRUCTURE IS HIGHER THAN 1.8M PLEASE PROVIDE A DESCRIPTION AS TO HOW THESE PANELS WILL BE SERVICED	

### Anti-theft connectors

Anti-theft connectors (Specification sheet to be added)	
DOES THE FIXING INCLUDE THE CLAMP OR IS IT ONLY THE NUT/BOLT FOR FIXING THE PV MODULE TO THE SUBSTRUCTURE	
CORROSION PROTECTION AND UV PROTECTION	
MANUFACTURER	
MATERIAL (STAINLESS STEEL, GALVANISED ETC.)	
WARRANTY/GUARANTEE	



**Fence**
**Clearvu fence or similar -High security level (Specification sheet to be added)**

MANUFACTURER NAME	
CORROSION PROTECTION AND UV PROTECTION	
MATERIAL (STAINLESS STEEL, GALVANISED ETC.)	
WARRANTY/GUARANTEE	

**Electric fence**
**Electric fence (Specification sheet to be added)**

MANUFACTURER NAME OF ENERGIZER	
ENERGIZER JOULE OUTPUT	
WIRE MATERIAL (STAINLESS STEEL, GALVANISED ETC.)	
HIGH TENSILE WIRE?	
THICKNESS OF WIRE	
TYPE OF INSULATORS	
ENERGIZER WARRANTY	
SYSTEM WARRANTY	

**PV Module**
**PV Module (Specification sheet to be added)**

PEAK POWER (PMPP)	
OPEN CIRCUIT VOLTAGE (VOC)	
SHORT CIRCUIT CURRENT (ISC)	
MAXIMUM POWER VOLTAGE (VMPP)	
MAXIMUM POWER CURRENT (IMPP)	
MAXIMUM SYSTEM VOLTAGE	
WORKING TEMPERATURE RANGE	
HAILSTONE IMPACT	
<b>MECHANICAL CHARACTERISTICS</b>	
DIMENSION (LENGTH X WIDTH X DEPTH)	
WEIGHT	
CONNECTOR TYPE AND MANUFACTURER	
JUNCTION BOX TYPE AND MANUFACTURER	
CELL (POLY CRYSTALLINE OR MONO CRYSTALLINE) AND SIZE	
NO. OF CELLS AND CONNECTIONS PER PANEL	
<b>TEMPERATURE/COEFFICIENTS</b>	
TEMPERATURE COEFFICIENT VOC	
TEMPERATURE COEFFICIENT ISC	
TEMPERATURE COEFFICIENT PMPP	
<b>QUALITY ASSURANCE</b>	

<b>DUST REDUCTION FACTOR</b>	
IEC/ISO/SABS CERTIFICATION	
PRODUCT WARRANTY/GUARANTEE [PANEL, JUNCTION BOX]	
PERFORMANCE WARRANTY/GUARANTEE [INCLUDE POWER DEPRECIATION GRAPH AS A FUNCTION OF TIME FOR A 25 YEAR PERIOD]	
AFTER SALES SUPPORT AVAILABILITY FOR PANEL	

### Inverter

Inverter (Hybrid) (Specification sheet to be added)	
<b>ELECTRICAL CHARACTERISTICS</b>	
RECOMMENDED POWER FROM PV ARRAY (kWp)	
OUTPUT POWER FROM INVERTER	
AC NOMINAL VOLTAGE	
NOMINAL FREQUENCY	
MAXIMUM LINE CURRENT	
AC CURRENT DISTORTION (% THD)	
OPEN CIRCUIT MAXIMUM VOLTAGE	
INVERTER EFFICIENCY (MAXIMUM)	
<b>MECHANICAL CHARACTERISTICS</b>	
DIMENSION (LENGTH X BREADTH X WIDTH)	
WEIGHT	
IP RATING	
OPERATING TEMPERATURE RANGE	
COOLING SYSTEM	
<b>SAFETY</b>	
IN BUILT PROTECTION FUNCTIONS	
SELF-MONITORING SYSTEM AND ALARMS	
<b>QUALITY ASSURANCE</b>	
IEC/ISO/SABS CERTIFICATION	
PRODUCT WARRANTY/GUARANTEE	
PERFORMANCE WARRANTY/GUARANTEE	

Please provide any particular plant room requirements if the inverter specified needs to be inside.  
Submission must include details of space requirements and ancillary services needed.

## SCADA

SCADA System (Specification sheet to be added)	
<b>Displayed Parameters</b>	
ARRAY VOLTAGE - VDC (V)	
GRID VOLTAGE - VAC (V)	
ARRAY CURRENT - IDC (A)	
GRID (INJECTED) CURRENT - IAC (A)	
ARRAY POWER - PDC (W)	
GRID (INJECTED) POWER - PAC (W)	
MODULE TEMPERATURE - T <sub>MODULE</sub> (°C)	
AMBIENT TEMPERATURE - T <sub>AMB</sub> (°C)	
SOLAR RADIATION - (W/M <sup>2</sup> )	
WIND SPEED (KM/H)	
ALARMS	
<b>FUNCTIONALITY</b>	
DATA LOGGING CAPABILITY WITH A USER FRIENDLY GUI AND AUTOMATED REPORT GENERATION CAPABILITY.	
COMMUNICATIONS INTERFACE (ETHERNET, INTERNET, DIAL UP ACCESS, GSM)	
SMS ALERTS	

## SURGE PROTECTION

Due to the sensitive nature of Sentech's equipment, only the best lightning protection and surge protection equipment shall be used:

Surge protection (Specification sheet to be added)	
MANUFACTURER NAME	
SURGE PROTECTION CONFORMS TO REQUIREMENTS AS SET OUT IN THE SPECIFICATIONS (Y/N)	
MIN OF TYPE 2 ON DC SIDE OF INVERTER (Y/N)	
COMBINED TYPE 1 & 2 AT THE AC COMBINER (Y/N)	
COMBINED TYPE 1 & 2 AT THE AC POINT OF CONNECTION (Y/N)	



Check sheet for drawings/schematics to be submitted			
		(Y/N )	Where can this info be found
1	PV panel site layout		
2	Earthing and lightning protection drawing		
3	Antitheft fixing specification sheet		
4	Clearvu or similar specification sheet		
5	PV module specification sheet		
6	Inverter specification sheet		
7	PV support structure drawing/specification sheet		
8	Monthly energy yield simulations		
9	P90 and P50 yield graphs (probability distribution)		
10	Veld fire prevention/control explanation		
11	Monitoring specification sheet		
12	DC schematic		
13	AC schematic		
14	Monitoring schematic (including all items measured from weather station)		
15	Electric fence energizer spec sheet		
16	Project plan/timeline		
17	Proof of Registration with department of labour (As three phase electrician)		
18	Proof of CIDB rating		
19	Surge protection specification sheet		
20	Latest tier 1 PV module list		
21	BBBEE certificate		