	Standard	FSOU
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Title: **TECHNICAL EVALUATION
CRITERIA FOR THE INSTALLATION
OF AN OFF-GRID SOLAR PV AND
BATTERY ENERGY STORAGE
SYSTEMS AT SANTIAGO AND
HAMILBERG FARM**

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1. Introduction

This document outlines the technical evaluation criteria that Eskom will use to assess tender submissions for the design, supply, installation, commissioning, and maintenance of household solar photovoltaic (PV) system, battery energy storage system (BESS), power conversion system, and telecommunication and control plant at Santiago and Hamilberg Farm located on Drakensburg foothills. The purpose of this document is to provide tenderers with a comprehensive understanding of the technical standards and requirements against which their proposals will be evaluated. These criteria will form a critical part of Eskom's assessment process, ensuring that the proposed solutions meet the necessary specifications for performance, reliability, and long-term operational sustainability.

2. Supporting Clauses

2.1 Scope

This document comprises the technical evaluation criteria and supporting documentation related to a commercial enquiry for the comprehensive scope of work involving the design testing, documentation development, training, supply, delivery, off-loading, erection, commissioning, operation, and maintenance of an off-grid solar photovoltaic (PV) system and battery energy storage system at Santiago and Hamilberg Farm.

The solution shall be designed to accommodate and supply power to each of the 9 stands at Santiago and Hamilberg farm located on Drakensburg foothills. The anticipated output of the solar PV is 5kWp (assessments must be done to establish output) and must include an inverter and battery energy storage.

The scope shall consist of but is not limited to:

- The off-grid systems shall supply power at Santiago to 9 stands and 14x20A electrification loads.
- The solution shall be designed to provide power to each stand or group of houses in an off-grid configuration, with load limits as set out in Table 1.
- The design selection must comply to the requirements set out in the environmental studies.
- The technical requirements for major equipment such as PV modules, inverters and battery energy storage should conform to document 240-171000418
- The solution must adhere to all requirements stated in Preliminary Design Scope Report for the installation of Santiago and Hamilberg Farm Home Solar System (240-43921804, Rev 0_2)
- The Department of Electricity and Energy (DEE) have requested that this site should be rooftop PV or structure mounted but will not be containerised.

Table 1: Load Management Schedule (240-171000131)

Summer (Configurable)		Winter (Configurable)		Stage	House Amp Limit
Start Time	End Time	Start Time	End Time		
09:00	17:59	10:00	16:59	1	10
18:00	21:59	17:00	20:59	2	1
22:00	04:59	21:00	04:59	3	0.5
05:00	08:59	05:00	09:59	2	1

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2.1.1 Purpose

The purpose of this document is to outline the technical evaluation criteria and requirements for the design, supply, installation, commissioning, and maintenance of a solar photovoltaic (PV) and battery energy storage system (BESS) at Santiago and Hamilberg Farm, providing guidance for tenderers on the standards and expectations for the project.

This document serves as a detailed guide for tenderers and evaluators, outlining the expectations and technical requirements for ensuring the successful execution and lifecycle management of the system.

2.1.2 Applicability

This document is applicable exclusively to Eskom's Distribution Division within the Central East Cluster.

2.1.3 Effective date

It shall be the date on the last signature (authorization date)

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] 240-48929482: Tender Technical Evaluation Procedure
- [3] 32-1034: Eskom Procurement and Supply Chain Management Procedure
- [4] 240-171000131: Site Design Considerations for Containerised Microgrid Generator and Energy Storage System
- [5] 240-171000418: Major Equipment Requirements for Distribution Solar PV and BESS
- [6] 240-43921804: Preliminary Design Scope Report for the installation of Santiago and Hamilberg Farm Home Solar System

2.2.2 Informative

None.

2.3 Definitions

2.3.1 General

Definition	Description
Tender	A tender refers to an open or closed competitive request for quotations / prices against a clearly defined scope / specification.

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2.3.2 Controlled Disclosure

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Description
BESS	Battery Energy Storage System
DEE	Department of Electricity and Energy
FAT	Factory Acceptance Test
FC	Fully compliant
ILAC	International Laboratory Accreditation Cooperation
NC	Non-compliant (major deviation)
PC	Partially compliant (minor deviation)
PV	Photovoltaic
SANAS	South African National Accreditation System
SAT	Site Acceptance Test
SME	Subject Matter Expert
STC	Standard Test Conditions
TEC	Technical Evaluation Criteria
TET	Technical Evaluation Team

2.5 Roles and Responsibilities

All Eskom employees and/or appointed bodies responsible for procuring Solar PV and BESS for installation at Santiago and Hamilberg Farm must ensure that the deliverables comply with the specified technical evaluation criteria.

2.6 Process for Monitoring

The acceptance of the Solar PV and BESS solution will be based on a thorough evaluation of the fully compliant design review and documentation submission.

After the contract is awarded, the components procured by the successful bidder will be subjected to technical quality inspections prior to the installation of any of the proposed components as a solution to the project.

2.7 Related/Supporting Documents

Refer to clause 2.2 of this document.

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3. Overview and Expectations of the Tender Technical Evaluation Process

Technical evaluations are a critical function carried out by engineers and technical specialists in alignment with the Eskom Procurement and Supply Chain Management Policy (32-1033) and the Eskom Procurement and Supply Management Procedure (32-1034). These evaluations play an essential role in ensuring that tender processes adhere to established procurement standards.

The Technical Evaluation Strategy will outline the following evaluation criteria:

- Mandatory Evaluation Criteria
- Functional Scoring Criteria

The process begins immediately after the receipt of tender submissions following the closing date, under the guidance of a Procurement Practitioner. Throughout the evaluation, if any indication of dishonesty or misrepresentation is found in a tenderer's submission, Eskom reserves the right to disqualify the tenderer and cancel any related contracts, if applicable.

By adhering to this structured and consistent approach, Eskom ensures that technical evaluations are conducted with the highest levels of integrity and professionalism.

The evaluation process will align with the Request for Proposal (RFP) commercial process, ensuring a thorough assessment of the proposed solutions. While considering the Tenderer's suggested solution, the equipment proposed must meet the requirements outlined in the Technical Schedules A and B, as well as comply with the relevant standards and regulations referenced within these schedules. The primary evaluation will focus on the submission of fully completed Technical Schedules, supported by appropriate documentation.

3.1 Technical Returnable Documents

- 3.1.1 The primary evaluation criterion is the submission of fully completed Technical Schedules A and B, which must be provided electronically in softcopy format.
- 3.1.2 The supporting documents shall include items such as datasheets, technical drawings, brochures, technical manuals, type test certificates, and test reports.

Note: Only type test certificates and test reports issued by accredited independent test laboratories (such as SANAS or ILAC) will be accepted.

- 3.1.3 Bidders may submit alternative test certifications or standards that demonstrate compliance with similar tests for the proposed equipment. These alternative certifications will be evaluated by the Technical Evaluation Team (TET) based on the adequacy of the information provided. Bidders must clearly explain and justify the alternative tests by submitting detailed information about the tests performed and the outcomes achieved.
- 3.1.4 All supporting documents specifically compiled for the tender, such as site layout drawings, design calculations, and similar materials, must be submitted by the tender closing date.
- 3.1.5 No additional supporting evidence will be accepted after the tender submission deadline.
- 3.1.6 Bidders are encouraged to organize their submissions in a manner that helps the TET locate returnable and supporting documents.
- 3.1.7 When completing the "Schedule B (Compliance)" and "Reference / Statement (Supporting Evidence)" columns, the Tenderer is required to provide a clear and accurate statement of the compliance level for each clause that necessitates such a declaration in the "Schedule B (Compliance)" column. The following compliance options are available from the provided dropdown list in Schedule B:
 - a. Comply – Confirmation of full compliance with all clauses of the relevant section or clause of the Technical Standard. No deviations are permitted.

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- b. Partially Comply – Acknowledgement of partial compliance, where full compliance is not feasible. Deviations may occur, and non-compliances are possible.
- 3.1.8 The Tenderer must list all deviations in the designated “Deviation Schedule” worksheet, providing clear reasons and any proposed alternatives. The document reference number, title, specific clause, and details of the deviation must also be clearly specified.
- 3.1.9 The verification of Schedule A and B responses provided by Tenderers will be carried out as follows, as specified in the schedules:
 - a. **Tenderer response accepted at face value:** For less critical functionality, Eskom will not verify these items during the tender evaluation. Compliance will instead be confirmed through a Technical Quality Inspection of the key components, namely the Inverter, Lithium Iron Phosphate Batteries, and PV Panels, prior to installation.
 - b. **Tenderer response verified through supporting documentation:** Responses will be cross-checked against the provided documentation to ensure accuracy and compliance.

3.2 Tender Evaluation Process

- 3.2.1 All tenders must meet the mandatory technical criteria. Any tender that fails to meet these criteria will be disqualified, deemed non-compliant, and considered non-responsive.
- 3.2.2 Tenders that successfully pass the mandatory phase will proceed to be evaluated against the functional criteria.
- 3.2.3 To be considered technically acceptable, a tender must achieve a minimum overall weighted final score of 80% in the functional evaluation.
- 3.2.4 Eskom reserves the right to lower the threshold, provided that a supporting justification is submitted.
- 3.2.5 Tenderers that make it through the TEC will be recommended for further evaluation by other disciplines.

Only tenderers who achieve a minimum score of 80% in the Functional Scoring Technical Evaluation Criteria will be eligible to provide further clarifications to ensure full compliance with Eskom’s technical requirements. This means that all technical requirements must ultimately be met at 100%.

Note: This process ensures that the product fully complies with the technical evaluation criteria, guaranteeing it meets Eskom’s standards before proceeding further.

- 3.2.6 Such post tender clarifications as required shall not be used to render a non-responsive tender response or to change the outcome of scoring or ranking. Clarifications shall not trigger changes in the price, scope, lead times or risk position of Eskom or the tenderer. The objective is to provide assurance to Eskom that any remaining ambiguities arising during the functional technical evaluation stage are resolved prior to contract award recommendation. During this stage of clarification that will be administered through the relevant appointed Procurement Practitioner, documents that are required to resolve outstanding matters for full compliance in support of the technical requirements shall be submitted by the tenderer. This is required prior to the contract award recommendation.
- 3.2.7 After the contract is awarded, the components procured by the successful bidder will be subjected to technical quality inspections prior to the installation of any of the proposed components as a solution to the project.

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3.3 Scoring

- 3.3.1 Each item will be evaluated by the TET based on the quality of the tendered response, verified where applicable (refer to Table 2). This applies to all items except for Technical Schedules A and B, which will be assessed based on the weight assigned to each item listed in the schedules.
- 3.3.2 Technical Schedules A and B will be assessed using weighted criteria, with each item allocated a percentage contributing to the overall score (100%). Items will be evaluated for compliance, with fully compliant items receiving the full score and non-compliant items receiving no score (zero).
- 3.3.3 Items with no supporting documentation (where required) will be scored as non-compliant (zero).

Table 2: Scoring of items in Technical Schedules A and B

Criteria	Abbreviation	Score
Does Not Comply	DNC	0
Partial or Unclear Compliance	PC	0
Compliant and Acceptable Response	CAR	1

- 3.3.4 The TET will follow the guidelines in Table 3 to ensure consistent scoring across all tender responses.

Table 3: Guideline for Scoring of Items

Abbreviation	Guideline
DNC	NO information provided OR does not comply with the requirement
PC	Missing information OR partially compliant
CAR	Compliant response with minimum required detail and clarity. "It's all there"

- 3.3.5 Items with no references to supporting documentation (where applicable) will be scored non-compliant (zero).
- 3.3.6 If a response claims "Comply" but is found partially or non-compliant during verification, a score of zero will be assigned.
- 3.3.7 If "Do Not Comply" or "Partially Comply" is selected, but verification shows the item is compliant, the original response will still be scored as non-compliant or partially compliant.
- 3.3.8 Items with no response selected will automatically be scored as "Do Not Comply." Technical Schedule A and B items for which no selection is provided shall automatically be scored as "Do Not Comply" regardless of the supporting evidence provided.
- 3.3.9 All responses will be assigned a score of either 0 or 1.
- 3.3.10 Each item's score will be multiplied by its assigned weight to determine the total score for that item. The scores for all items in the Technical Schedule A and B will be summed, and a percentage will be calculated based on the maximum possible score. This percentage will represent the score for each sub-system or standard section. These sub-system scores will then be weighted to calculate the overall score for the proposed solution.

3.4 Mandatory Evaluation Criteria

If a response of 'NO' is given for any criterion outlined in Table 4 below, the assessed tendered design will be automatically disqualified from advancing to the next stage of the Functional Evaluation process. This disqualification emphasizes the importance of meeting all specified requirements to ensure that the design is considered for further evaluation.

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Note: Only resources who are direct employees of the tendering company or employees of a subcontractor with valid documented agreement in place will be considered. Any information submitted for individuals who have no formal affiliation with the tendering entity will not be evaluated.

Table 4: Mandatory Technical Evaluation Criteria

No.	Description of Mandatory Technical Criteria	Tender Returnable	Compliance (YES/NO)
1	Resource Capability		
1.1	Skills Base		
1.1.1	Electrical Design Engineer/s	<ul style="list-style-type: none"> a) Certified copies of Qualifications b) ECSA registered Professional Engineer or Professional Technologist. 	
1.1.2	Structural Design Engineer/s	<ul style="list-style-type: none"> a) Certified copies of Qualifications b) ECSA registered Professional Engineer or Professional Technologist. 	
1.1.3	Professional Quantity Surveyor	<ul style="list-style-type: none"> a) Certified copies of Qualifications b) Professional registration with the SA Council for the QS Profession (SACQSP) 	
1.1.4	Single Phase Tester/Installation Electrician/Master Installation Electrician (Department of Labour Registration as an Electrical Contractor)	<ul style="list-style-type: none"> a) Tendering company or its sub-contractor's valid Department of Labour Certificate (Letter of Registration as an Electrical Contractor). b) Certified copy of wireman's license card of a registered person in the Tendering Company/Sub-Contractor, showcasing the registration number 	
1.1.5	One competent resource demonstrating prepaid meter training employed at the tendering company during the tender period.	<ul style="list-style-type: none"> a) Certified copies of training certificates (OTO 06A, OTO 06c, OTO 06g), issued by Eskom or an accredited facilitator that is listed on Eskom's National Facilitators Database 	

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1.2	Software and Tools		
1.2.1	Design and simulation software for solar power systems i.e. PVsyst, PV SOL, Helioscope, OpenSolar, SolarEdge Designer, etc.	Proof of a valid license/subscription.	
1.2.2	CAD software for design drawings.	Proof of a valid license/subscription.	
1.3	Related Experience		
1.3.1	Related Solar PV and BESS projects.	List of at least three previous Solar PV and BESS projects that were designed, constructed, and commissioned, indicating installed PV battery and inverter capacity, year of completion, location and client reference letter which shall include the client's contact details.	
2	Documentation		
2.1	Submission of Operating and Maintenance (O&M) training manuals.	Operating and Maintenance (O&M) training manuals for the entire Solar PV and Battery Energy Storage System (BESS).	
2.2	Submission of completed and signed deviation schedules.	<ul style="list-style-type: none"> a) Deviation Schedule: PV Module b) Deviation Schedule: Inverter c) Deviation Schedule: Lithium Iron Phosphate Batteries 	
2.3	Submission of completed and signed Technical Schedules A and B.	<ul style="list-style-type: none"> a) Technical Schedule AB: PV Modules b) Technical Schedule AB: Inverter c) Technical Schedule AB: Lithium Iron Phosphate Batteries 	
2.4	Submission of confirmation letters verifying adherence to testing and standards for the installation of Solar PV and BESS, specifically for PV modules, inverters, and lithium iron phosphate batteries in the templates provided.	<ul style="list-style-type: none"> a) LTRINV_SH_001 b) LTRPV_SH_002 c) LTRLFP_SH_003 	
2.5	Submission of all design reports, including the drawings specified in Technical Schedules A and B, for the required technologies.	<ul style="list-style-type: none"> a) Reports and drawings as specified in Section 4.1 of the Functional Evaluation Criteria. b) PV Panel: OEM drawing showcasing dimensions in metric units (include the drawing & revision number on the submission) c) LFP Batteries: OEM drawing showcasing dimensions in 	

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		metric units (include the drawing & revision number on the submission)	
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3.5 Functional Evaluation Criteria

Bids that satisfy all Mandatory Evaluation Criteria outlined in Table 4 will proceed to be assessed against the Functional Evaluation Criteria detailed in Table 5. The evaluation of these functional criteria will be based on the Bidder's level of compliance with the technical requirements set forth in Bid Technical Schedules A & B (Annexure B-D). Compliance levels are defined as follows:

- **Compliant and Acceptable Response:** Full compliance with all clauses of the relevant section of the Technical Standard, with no deviations.
- **Partial or Unclear Compliance:** Partial compliance, indicating that full compliance is not possible, with deviations and potential non-compliances noted.
- **Do Not Comply:** Non-compliance with all requirements in the specified section.

The Bidder is required to respond to each criterion, indicating the level of compliance. Where "compliance with reference" is necessary, the Bidder must provide the corresponding supporting documentation.

In cases where the response is "Partial Compliance" or "Do Not Comply," the Bidder must provide a list of deviations, reasons for these deviations, and any proposed alternatives. Deviations – those that, if accepted, would prevent the Bid from fulfilling its intended purpose – will result in technical rejection of the Bid.

Bids deemed substantially responsive under this process will be recommended from a technical standpoint. A substantially responsive Bid is one that meets the technical requirements without deviation, reservation, or omission.

Each item will be evaluated by the TET based on the quality of the tendered response, verified where applicable (refer to Table 2). This applies to all items except for Technical Schedules A and B, which will be assessed based on the weight assigned to each item listed in the schedules.

Technical Schedules A and B will be assessed using weighted criteria, with each item allocated a percentage contributing to the overall score (100%). Items will be evaluated for compliance, with fully compliant items receiving the full score and non-compliant items receiving no score (zero).

Table 5: Functional Scoring Technical Evaluation Criteria

No.	Functional Technical Criteria Description	Tender Returnable	Weight
3	General		15%
3.1	Completed Tenderer Information Schedule	Tenderer Information Schedule	5%
3.2	Operating & Maintenance Training	3.2.1 Facilitator's experience and qualifications – submission of the facilitator's CV including qualifications.	5%
		3.2.2 Training type and level of detail which includes O&M, plant, and inverter training.	5%
4	Design Reports		25%

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4.1	<p>Detailed design: Installation of a PV and BESS at Santiago and Hamilberg Farm.</p> <p>Note: All design reports must be signed off by a Professional Engineer or Technologist registered with ECSA, with expertise in the relevant discipline related to the proposed design, or by a specialist recognized by and registered with the ECSA.</p>	4.1.1 PV System Design Report	10%
		4.1.2 SLD: PV Plant including subsystems.	5%
		4.1.3 Structural Design Report	5%
		4.1.4 Mounting Structure Design	5%
5	Submission of Technical and Deviation Schedules		50%
5.1	PV Modules	5.1.1 Technical Schedule A and B	13%
		5.1.2 Deviation Schedule	4%
5.2	Inverters	5.2.1 Technical Schedule A and B	13%
		5.2.2 Deviation Schedule	3%
5.3	Lithium Iron Phosphate Batteries	5.3.1 Technical Schedule A and B	13%
		5.3.2 Deviation Schedule	4%
6	Maintenance		10%
6.1	Preventative Maintenance Schedule	Submission of a maintenance schedule for all components that are to be installed.	4%
6.2	Corrective Maintenance	A letter, signed by the company's Director, confirming the tenderer's ability to provide corrective maintenance for two (2) years post-installation, including response times for repairs and replacements, must be submitted. If maintenance services are subcontracted, contracts must also be provided.	4%
6.3	Spare Parts List	Provide a detailed list of spare items and associated costs and quantities.	2%

4. Acceptance

This document has been seen and accepted by:

Name and surname	Designation
Emmanuel Mokalanyane	Manager: Design Engineering (Distribution and Electrification)
Andre Demons	Manager: Design (Civil)
Roshan Pillay	Middle Manager: Network Engineering & Design
PJ Burger	Design Engineer: Design Engineering (Distribution and Electrification)

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Name and surname	Designation
Palesa Mokgothu	Manager: Project Execution
Rudi Kleinhans	Manager: Standards Implementation
Martha De Bruyn	Procurement Practitioner

5. Revisions

Date	Rev.	Compiler	Remarks
August 2025	1	Patric Kabaze	First Issue
August 2025	0	Patric Kabaze	Draft technical evaluation criteria compiled for the installation of solar PV and BESS at Santiago and Hamilberg Farm, located on Drakensberg foothills.

6. Development Team

The following people were involved in the development of this document:

- Patric Kabaze
- Kelebogile Kgosiatsela

7. Acknowledgements

- KZN OU Standards Implementation Team

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ANNEXURE A: Tender Information Schedule

Schedule A: Purchasers specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

1	2	3	4
Item	Question	Response	Proof Submitted
1	Tenderer		
1.1	Company name		
1.2	Company address		
1.3	Contact details		
1.4	Website address		
1.5	Company organogram		
1.6	Does your company have ISO 9001:2015 or similar certification? If yes, what is the expiration date of such certification?		
1.7	Does your company have ISO 45001/OHSAS 18001 or similar certification? If yes, what is the expiration date of such certification?		
1.8	If other certifications exist, please state them here.		
1.9	Is there a formal agreement between your company and the manufacturer (OEM)?		
1.10	Have your staff been trained on the equipment been offered?		
1.11	Will your company be able to provide the following after sales support if and when required:		
1.11.1	Technical Support		
1.11.2	Installation		
1.11.3	Commissioning		
1.11.4	Maintenance		

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1.12	Does your company have the capability to perform local faultfinding and repairs?		
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BIDDER's SIGNATURE

Name (Print)

Company Name

Sign

Date

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ANNEXURE B: Technical Schedules A and B for Inverters

1	2	3	4	5
Item	Description	Parameters	Schedule A	Schedule B
1	Product Information			
1.1	OEM	OEM Name	xxxxxxxxxx	
2	Inverter Characteristics			
2.1.1	Inverter type	Specify	Hybrid	
2.1.2	Maximum conversion efficiency	%	≥ 95	
2.1.3	Operating temperature range (without derating within this range). Sunshade shall be installed. Concept shall be briefly explained in inverter concept within tender.	°C	-15 to +60	
2.1.4	Connection phases	Yes/No	Single-Phase	
2.1.5	Frequency	Hz	50	
2.1.6	Total Harmonic Distortion	%	≤ 10	
2.1.7	IP for inverter installed outdoor (EN 60529)	Specify	≥IP65 or better	

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2.1.8		Cooling concept	Specify	Designed for installation and operation in conditions such as high humidity and corrosive salt air.	
2.1.9		Controllability of inverter output per remote control/energy management system.	Specify	Dynamic adjustable	
2.1.10		Earthing concept	Specify	Earthing according to installation requirements of PV module OEM.	
2.1.11		Multiple MPPT functionality	Yes/No	Required	
2.1.12		String failure detection	Yes/No	Required	
2.1.13		DC overvoltage protection	Yes/No	Required	
2.1.14		Surge protection	Yes/No	Required	
2.2	•	Product Warranty and Performance Guarantee			
2.2.1		Product warranty	Specify	10 Years	
3		Documentation for Acceptance of the Proposed Inverter			
3.1		Detailed technical specifications	Present documentation	Required	
3.2		Product information catalogue	Present documentation	Required	
3.3		Installation manual	Present documentation	Required	

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**TECHNICAL EVALUATION CRITERIA FOR THE
INSTALLATION OF OFF-GRID SOLAR PV AND BATTERY
ENERGY STORAGE SYSTEM (BESS) AT SANTIAGO AND
HAMILBERG FARM**

Unique Identifier: 559-666119467

Revision: 1

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3.4		Summary of the product's cleaning strategy	Present documentation	Required	
3.5		Calculations for ensuring electrical compatibility between the inverters and the modules	Present documentation	Required	
3.6		Operating and maintenance manual	Present documentation	Required	
3.7		Confirmation of Adherence to Testing and Standards for Solar PV and BESS Installation	Present documentation	Required	

Name (Print)

Company Name

Sign

Date

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ANNEXURE C: Technical Schedules A and B for PV Modules

1	2	3	4	5
Item	Description	Parameters	Schedule A	Schedule B
1	Operating Environment			
1.1	Altitude above sea level (e.g., 1000, 1600)	m	1000m - 1800m	
1.2	Extreme maximum temperature	°C	50	
1.3	Extreme minimum temperature	°C	-5	
1.4	Ambient air quality	Describe	Heavy	
1.5	Average humidity	%	10% - 85%	
1.6	Average daily sunshine hours	Hours	5	
2	Product Information			
2.1	• PV Module Information and Characteristics			
2.1.1	OEM	OEM Name	xxxxxxxxxx	
2.1.2	OEM's factory location	Factory Location	xxxxxxxxxx	
2.1.3	OEM's product code	Specify Code	xxxxxxxxxx	

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2.1.4		OEM drawing showcasing dimensions in metric units (include the drawing & revision number on the submission)	Drawing	xxxxxxxxxx	
2.1.5		PV panel type		Monocrystalline	
2.1.6		Module efficiency		>19% (STC)	
2.1.7		Peak output power per panel	Wp	≥ 550 Wp	
2.1.8		Temperature coefficient on MPP	- %/°C	≥ - 0.45%/°C	
2.1.9		Nominal power tolerances from manufacturers (used for acceptance to the module)	%	0% ≤Pnom ≤ +5%	
2.2	•	Product Warranty and Performance Guarantee			
2.2.1		Power output guaranteed during the first year of operation	%	97%	
2.2.2		Linear degradation coefficient from year 2 to year 20	%/year	0.8%/year	
2.2.3		Guaranteed output of nominal power after 10 years	%	≥90%	
2.2.4		Guaranteed output of nominal power after 20 years	%	≥80%	
2.2.5		Product performance warranty	Years	25	
2.2.6		Product warranty against manufacturing defects	Years	10	
3		Documentation for Acceptance of PV Modules			

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3.1		Detailed technical specifications	Present documentation	Required	
3.2		Limited product and peak power warranty	Present documentation	Required	
3.3		Installation manual	Present documentation	Required	
3.4		Summary of the product's cleaning strategy	Present documentation	Required	
3.5		Product's recycling strategy	Present documentation	Required	
3.6		Operating and maintenance manual	Present documentation	Required	
3.7		Confirmation of Adherence to Testing and Standards for Solar PV and BESS Installation	Present documentation	Required	

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ANNEXURE D: Technical Schedules A and B for Lithium Iron Phosphate Batteries

1	2	3	4	5
Item	Description	Parameters	Schedule A	Schedule B
1	Operating Environment			
1.1	Altitude above sea level (e.g., 1000, 1600)	m	1800	
1.2	Extreme maximum temperature	°C	50	
1.3	Extreme minimum temperature	°C	-5	
1.4	Ambient air quality	Describe	Heavy	
1.5	Lightning	Describe	High	
1.6	Relative humidity	%	10% - 85%	
2	Product Information			
2.1	• LFP Information and Characteristics			
2.1.1	OEM	OEM Name	xxxxxxxxxx	
2.1.2	OEM's factory location	Factory Location	xxxxxxxxxx	
2.1.3	OEM's product code	Specify Code	xxxxxxxxxx	

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2.1.4	OEM drawing showcasing dimensions in metric units (include the drawing & revision number on the submission)	Drawing	xxxxxxxxxx	
2.1.5	Cell type	Specify	Prismatic	
2.1.6	Rated capacity	Ah or kWh	Specify	
2.1.7	Wet weight mass	kg	OEM to indicate	
2.1.8	Discharge performance at +25 °C	Specify	Refer to 240- 170000103 Cl. 3.2.3	
2.1.9	Discharge performance at low temperature	Specify	Refer to 240- 170000103 Cl. 3.2.4	
2.1.10	High rate discharge permissible current	Specify	Refer to 240- 170000103 Cl. 3.2.5	
2.1.11	Fully charge state – under float	V	Specify	
2.1.12	Minimum voltage/LFP cell	V	2.5	
2.1.13	Maximum voltage/LFP cell	V	4.2	
2.1.14	Short-circuit current	kA	OEM to indicate	
2.1.15	Internal resistance	Ω	OEM to indicate	
2.1.16	Maximum allowable RMS ripple current and effect on battery life	A	<5A/100Ah	
2.1.17	Maximum allowable RMS ripple voltage and effect on battery life	mV	0.01 x Vnom	

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2.2	•	Product Warranty and Performance Guarantee			
2.2.1		Expected life	Specify	10 Years	
2.2.2		End-of-life (EOL) capacity	%	80	
2.2.3		Capacity loss	%Ah/Year	1.33	
2.2.4		Number of cycles to EOL	Specify	5000	
2.3	•	Battery Management System			
2.3.1		Undervoltage disconnect	Yes/No	Required	
2.3.2		Overvoltage protection	Yes/No	Required	
2.3.3		Over temperature shutdown	Yes/No	Required	
2.3.4		Short circuit protection	Yes/No	Required	
2.3.5		Cell balancing	Yes/No	Required	
2.4	•	Transportation and Disposal			
2.4.1		What transport company will be used for deliveries?	Specify	xxxxxxxxxx	
2.4.2		Do they have the necessary licensing to operate as a dangerous goods transporter?	Yes/No	xxxxxxxxxx	
2.4.3		What procedures are in place to manage field failures and ensure that these are effectively and timeously addressed.?	Specify	xxxxxxxxxx	
2.4.4		What procedures are in place to manage field failures and ensure that these are effectively and timeously addressed.?	Specify	xxxxxxxxxx	

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2.4.5		What recycling procedure is in place to ensure that redundant equipment is recycled in an environmentally friendly manner?	Specify	xxxxxxxxxx	
3	Documentation for Acceptance of LFP Batteries				
3.1		Discharge test results	Present documentation	Required	
3.2		If not the OEM, a licensed OEM distributor agreement must be provided.	Present documentation	Required	
3.3		Installation manual	Present documentation	Required	
3.4		Product's recycling strategy	Present documentation	Required	
3.5		Operating and maintenance manual	Present documentation	Required	
3.6		Confirmation of Adherence to Testing and Standards for Solar PV and BESS Installation	Present documentation	Required	

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