



CD41/2022

**SUPPLY AND DELIVERY OF SMART ENERGY
METERS (TOU) AND SIM CHIP MODEMS**

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1. INVITATION

CENTLEC (SOC) Ltd (herein referred to as CENTLEC) hereby invite bidders to bid for the supply and delivery of smart energy meters with their associated communication modems (SIM Chip) as detailed in the specification below for a period of thirty six (36) months. The bidder should also supply and deliver separate communications modem (SIM Chip) that will be **compatible** to the existing meters on the CENTLEC's network.

The CENTLEC areas of supply, where these meters would be installed, include the Greater Mangaung area (Bloemfontein, Botshabelo, Thaba Nchu, Dewetsdorp, Wepener and Van Stadensrus), Kopanong and Mohokare Local Municipalities, as well as any other Municipality that may be added as part of the SDA.

2. MINIMUM SUBMISSION REQUIREMENTS

Any omission of the listed items would render an automatic disqualification

- 2.1 Supply unique security personal identification number (PIN) and/or original TAX Clearance Certificate for TAX compliant status.
- 2.2 Supply municipal services (water, sanitation, rates and electricity) clearance certificate or Lease Agreement with a current Bill and rates clearances, or Current Bill of Account not owing more than 30 days. In a case where the services are paid for by the Landlord, the lease agreement must be signed by the applicable stakeholders.
 - 2.2.1 In an event that the Bidder utilizes prepaid services (e.g. water and or electricity) a valid municipal clearance certificate(s) must still be provided.
 - 2.2.2 Bidders that are CENTLEC (SOC) Ltd customers are also expected to attach a valid electricity clearance certificate.
- 2.3 Submit proof of registration on the National Treasury Centralized Supplier's Database
- 2.4 Submit proof of ISO 9001 accreditation for the manufacturer of the goods.

3. LOCAL CONTENT PRE-QUALIFICATION

Preferential Procurement Regulations 2017 section 8 (Local production and content) states that:

(2) An organ of state must, in the case of a designated sector, advertise the invitation to tender with a specific condition that only locally produced goods or locally manufactured goods, meeting the stipulated minimum threshold for local production and content, will be considered.

(5) A tender that fails to meet the minimum stipulated threshold for local production and content is an unacceptable tender.

NB!!! Bidders are required to complete Annexure C, D & E for declaration of Local Content %.

These designated sectors include the following (But are not limited) with the minimum threshold:

Designated Sector	Minimum Threshold
Smart Meters	50%

4. ACRONYMS AND ABRIVIATIONS

- AC – Alternating Current
- CT – Current Transformer
- VT – Voltage Transformer
- MV/HV – Medium Voltage / High Voltage
- RMS – Root Mean Square
- Hz - Hertz
- TOU – Time Of Use
- L-L – Line to Line
- L-N – Line to Neutral
- kWh – kilo Watt hour
- kVA – kilo Volt Amperes
- kVAh – kilo Volt Amperes hour
- kVARh - Kilo Volt Amperes reactive hours
- MD – Maximum Demand
- AMR – Automated Meter Reading

- AMI – Advanced Metering Infrastructure
- SIM – Subscriber Identity Module
- SANS – South African National Standards
- IEC – International Electro-technical Commission
- ISO - International Organization for Standardization
- NRS – National Regulatory Services
- IEEE - Institute of Electrical and Electronics Engineers
- STS – Standard Transfer Specification
- LCD – Liquid Crystal Display
- CIU – Customer Interface Unit
- FLAG - Fibre Link Around the Globe
- DLMS - Device Language Message Specification
- COSEM - Companion Specification for Energy Management
- GSM - Global System for Mobile Communications
- GPRS - General Packet Radio Service GPRS/5G
- TCP/IP - Transmission Control Protocol and Internet Protocol)
- ADSL - Asymmetric digital subscriber line)
- LTE - Long Term Evolution
- LAN – Local Area Network
- LED – Light Emitting Diode
- SCTM - Serial Coded Tele-Metering
- FNP – Frontend Network Processor
- RTU – Remote Terminal Unit
- DNP3 - Distributed Network Protocol 3
- CPU – Central Processing Unit
- ROM – Read Only Memory
- RAM – Random Access Memory
- USB – Universal Serial Bus
- IP – Internet Protocol
- OTA - Over The Air
- TCP – Transmission Control Protocol
- AT – Attention

- APN - Access Point Name
- CSD – Circuit Data Service
- ICASA - Independent Communications Authority of South Africa
- ESKOM - Electricity Supply Commission

5. SCOPE OF WORK

The scope of this bid document includes the following requirements and services relating to the supply of Smart (TOU) Meters and Chip SIM modems together with their power supplies.

This specification sets the required minimum level of functionality for meters that are required to manage residential and commercial consumption in the areas currently supplied by CENTLEC. At present, residential and commercial customers are supplied by means of single and three phase kWh meters while Bulk customers are supplied by means of three phase four-quadrant meters. Single and three phase direct online kWh meters should be configurable in credit or in pre-paid mode.

The meters shall allow for the monitoring, remote meter reading, control and reporting on electricity consumption via a two-way communication system from a centralized computerized existing CENTLEC master station. The system master station includes facilities for remote disconnection of kWh meters as well as two auxiliary switched outputs to enable geyser and appliance control for all kWh meters.

The preferred meters are the ones that are compatible with the current AMR System owned by CENTLEC. In a case, that the bidder supplies meters that are not compatible with the CENTLEC AMR System, the supplied meters must have open protocol or the protocols should be provided for ease of integration to the system.

The bidder should CENTLEC with the program that is used to program and read the meters manually using an optical eye. This software should have a lifetime

access and the updates should be downloadable from the bidder / manufacturer's website.

6. NORMATIVE REFERENCES

Document	Title
Standards containing prescriptive references	
SANS/IEC 62052-31	Electricity metering equipment (a.c) – General requirements, tests and test conditions – Part 31: Metering equipment.
SANS/IEC 62052-21	Electricity metering equipment (a.c.) – General requirements, tests and test conditions – Part 21: Tariff and load control equipment
SANS/IEC 62052-21	Electricity metering equipment (a.c) – Particular requirements: Static meters for active energy (classes 1 and 2)
SANS/IEC 62053-23	Electricity metering equipment (a.c) – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3).
SANS/IEC 62055-41	Electricity metering – Payment systems – Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems.
SANS/IEC 62055-51	Electricity metering – Payment systems – Part 51: Standard transfer specification (STS) – Physical layer protocol for one-way numeric and magnetic card token carriers
SANS/IEC 62055-52	Electricity metering – Payment systems – Part 52: Standard transfer specification (STS) – Physical layer protocol for two-way virtual token carrier for direct local connection
SANS/IEC 62056-21	Electricity metering – Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange.

Document	Title
Standards containing prescriptive references	
NRS 096-1	Electricity metering – Ancillary specifications – Part 1: The sealing of electricity meters.
IEEE 802.16	Broadband wireless Metropolitan Area Networks (MANs)
SANS/IEC 62051	Electricity metering – Glossary of terms.
SANS 164-1	Plug and socket-outlet systems for household and similar purposes for use in South Africa – Part 1: Conventional system, 16 A 250 V a.c.
SANS 474 (NRS 057)	Code of practice for electricity metering.
SANS 1524-1	Electricity payment systems – Part 1: Prepayment meters.
SANS/IEC 61334	Distribution automation using distribution line carrier systems – Parts 1,3,4,5 and 6
SANS/IEC 62054-21	Electricity metering (a.c.) – Tariff and load control – Part 21: Particular requirements for time switches.
SANS/IEC 62058-31	Electricity metering equipment (a.c) – Acceptance inspection – Part 31: Particular requirements for static meters for active energy (class 0,5; 1 and 2). (Replacing IEC 6135)
SANS/IEC 60529	Degrees of protection provided by enclosures (IP Code).

7. TECHNICAL SPECIFICATIONS

7.1 ELECTRICAL ENERGY METERS

7.1.1 Directly connected Single-Phase kVA/kWh Smart Meter (5 to 100A)

The meter shall be fully programmable and shall make provision for “Time-of Use” tariffs applicable to CENTLEC. It shall have at least 12 energy registers and 6 maximum demand registers, each of which can be separately programmed to be operative in accordance with predetermined switching sequence. The meter should also be able to operate on postpaid and prepaid mode.

The meter shall be of solid state, fully electronic design with an internal quartz clock for the control of the integration period (block interval) and the switching of off-peak periods and multi tariffs (seasonal time of day switching). The seasonal time of day tariff program, off-peak program, as well as the individual energy and demand register values, shall be stored in genuine non-volatile memory to ensure totally secure memory retention in the event of a loss of mains voltage. If not otherwise specified, automatic month-end maximum demand reset shall be provided, as well as automatic storing of month end kWh register reading(s).

The meter shall measure kWh, kVAh, kVArh energy, Power Factor and kVA maximum demand, all preferable contained in a single compact housing, with minimum space requirements and standard connection block arrangement. The design of the meter shall be of a kind to provide maximum long-term stability, with minimum service requirements.

A built-in optical port (infrared data transmitting), RS232, RS485 and modem module together with the power supply shall be provided to enable direct communication to take place between the meter and a suitable external device. To accommodate for use in prepayment mode, a Customer User Interface (Keypad) is also a requirement.

The meter must have open protocol or if the meter is not compatible with CENTLEC AMR system the bidder must supply the protocols for integration to the AMR system.

The direct communication should include the following facilities:

- (i) Reading all the meter registers;
- (ii) Reading load survey data;
- (iii) Scaling the meter for direct reading at specific current transformer and voltage transformer ratios;
- (iv) Loading new off-peak and seasonal time of day tariff programs (not necessarily the same during weekdays and weekends);
- (v) Resetting the internal meter clock;
- (vi) Resetting the maximum demand registers (standard feature shall include automatic predetermined store and reset of MD and energy readings on a pre-set time monthly);
- (vii) Reading instantaneous values such as voltage, current, power factor, etc.

Phase	Single-Phase
Voltage range	220 - 240V
Current range	Direct connected 5-100A,
Frequency	50Hz
IEC approvals - Accuracy	IEC 62052:2003
IEC approvals - Ingress protection	IEC 60529:2004 (IP53 rating)
Product Life	15 years (10 years Certified)
Burden (Voltage)	1.15W, 2.8VA
Burden (Current)	2VA @ 100A/phase
Insulation	4kV RMS 50Hz
Impulse withstand	12kV 1.2/50μs, 40ohm source
Temperature - Operational	-25°C to +65°C
Temperature - Storage	-25°C to +85°C
Humidity	Annual Mean 75% (non-condensing)

Electronic	Yes
Dial	LCD
Class	0.5 or 1
Four Quadrant metering (VARh)	Yes
Register reset	Yes
Programmable	Yes
Inputs	No
Outputs	Yes (1, kWh)
Load Profile	Yes
Instrumentation Profiling	Yes
Ethernet Communication	Optional
RS232 Communication	Yes
RS485 Communication	yes
IrDA data	Optional
Internal/External Modem	yes
AMR/AMI capability	Yes
Data stream mode (fast data retrieval)	Optional
Event monitoring	Yes
Password protection	Yes
Time of Use Energy registers	Yes, 8 registers
Time of Use Demand registers	Yes (Minimum One)
Coincident Demand registers	Optional
TOU switching times	48
TOU seasons	12
TOU exclusion dates	32
Billing Dates (resets)	13
Historical sets	15
Deferred Tariff	Yes
Programmable Display	Yes
Programmable constants	Optional
Voltage imbalance monitoring	Optional
2 x VA registers	Yes

Reverse run detection	Yes, system & per phase
Customer registers	Yes (2 registers summing 2 internal values)
Read without power	Optional
Auxiliary voltage input	Optional
Calibration pulse	Yes
Display backlight	Optional
Import and export capabilities	Yes

7.1.2 Directly connected Three-Phase kVA/kWh Smart Meter (5 to 100A)

The meter shall be fully programmable and shall make provision for “Time-of Use” tariffs applicable to CENTLEC. It shall have at least 12 energy registers and 6 maximum demand registers, each of which can be separately programmed to be operative in accordance with predetermined switching sequence.

The meter shall be of solid state, fully electronic design with an internal quartz clock for the control of the integration period (block interval) and the switching of off-peak periods and multi tariffs (seasonal time of day switching). The seasonal time of day tariff program, off-peak program, as well as the individual energy and demand register values, shall be stored in genuine non-volatile memory to ensure totally secure memory retention in the event of a loss of mains voltage. If not otherwise specified, automatic month-end maximum demand reset shall be provided, as well as automatic storing of month end kWh register reading(s).

The meter shall measure kWh, kVAh, kVArh energy, Power Factor and kVA maximum demand, all preferable contained in a single compact housing, with minimum space requirements and standard connection block arrangement. The design of the meter shall be of a kind to provide maximum long-term stability, with minimum service requirements.

A built-in optical port (infrared data transmitting), RS232, RS485 and modem module together with power supply shall be provided to enable direct communication to take place between the meter and a suitable external device. To accommodate for use in prepayment mode, a Customer User Interface (Keypad) is also a requirement.

The meter must have open protocol or if the meter is not compatible with CENTLEC AMR system the bidder must supply the protocols for integration to the AMR system.

The direct communication should include the following facilities:

- i. Reading all the meter registers;
- ii. Reading load survey data;
- iii. Scaling the meter for direct reading at specific current transformer and voltage transformer ratios;
- iv. Loading new off-peak and seasonal time of day tariff programs (not necessarily the same during weekdays and weekends);
- v. Resetting the internal meter clock;
- vi. Resetting the maximum demand registers (standard feature shall include automatic predetermined store and reset of MD and energy readings on a pre-set time monthly);
- vii. Reading instantaneous values such as voltage, current, power factor, etc.

Phase	Three
Voltage range	110 - 120V/220-240V(L-N)/380 - 415V (L-L)
Current range	Direct connected 5-100A,
Frequency	50Hz
IEC approvals - Accuracy	IEC 62052:2003
IEC approvals - Ingress protection	IEC 60529:2004 (IP53 rating)
Product Life	15 years (10 years Certified)

Burden (Voltage)	1.15W, 2.8VA
Burden (Current)	2VA @ 100A/phase
Insulation	4kV RMS 50Hz
Impulse withstand	12kV 1.2/50 μ s, 40ohm source
Temperature - Operational	-25°C to +65°C
Temperature - Storage	-25°C to +85°C
Humidity	Annual Mean 75% (non-condensing)
Electronic	Yes
Dial	LCD
Class	0.5 or 1
Four Quadrant metering (VArh)	Yes
Register reset	Yes
Programmable	Yes
Inputs	No
Outputs	Yes (1, kWh)
Load Profile	Yes
Instrumentation Profiling	Yes
Ethernet Communication	Optional
RS232 Communication	Yes
RS485 Communication	yes
IrDA data	Optional
Internal/External Modem	yes
AMR/AMI capability	Yes
Data stream mode (fast data retrieval)	Optional
Event monitoring	Yes
Password protection	Yes
Time of Use Energy registers	Yes, 8 registers
Time of Use Demand registers	Yes (Minimum One)
Coincident Demand registers	Optional
TOU switching times	48
TOU seasons	12
TOU exclusion dates	32

Billing Dates (resets)	13
Historical sets	15
Deferred Tariff	Yes
Programmable Display	Yes
Programmable constants	Optional
Voltage imbalance monitoring	Optional
2 x VA registers	Yes
Reverse run detection	Yes, system & per phase
Customer registers	Yes (2 registers summing 2 internal values)
Read without power	Optional
Auxiliary voltage input	Optional
Calibration pulse	Yes
Display backlight	Optional
Import and export capabilities	Yes

Quantities to measure

- Import Wh
- Import Wh, Q1 and Q4 VARh
- Import Wh, Q1 and Q4 VARh, Import VAh
- Import/Export Wh
- Import/Export Wh, Q1, Q2, Q3, Q4 VARh
- Import/Export Wh, Import/Export VAh
- Import/Export Wh, Q1, Q2, Q3, Q4 VARh, VAh x 2
- 30min integration period for load profiles

7.1.3 Directly connected Three-Phase kVA/kWh Smart Meter (i). (5 to 150A), (ii). (5 to 250A) and (iii). (5 to 350A)

The meter shall be fully programmable and shall make provision for “Time-of

Use” tariffs applicable to CENTLEC as well as pre-payment functionality. It shall have at least 12 energy registers and 6 maximum demand registers, each of which can be separately programmed to be operative in accordance with predetermined switching sequence.

The meter shall be of solid state, fully electronic design with an internal quartz clock for the control of the integration period (block interval) and the switching of off-peak periods and multi tariffs (seasonal time of day switching). The seasonal time of day tariff program, off-peak program, as well as the individual energy and demand register values, shall be stored in genuine non-volatile memory to ensure totally secure memory retention in the event of a loss of mains voltage. If not otherwise specified, automatic month-end maximum demand reset shall be provided, as well as automatic storing of month end kWh register reading(s).

The meter shall measure kWh, kVAh, kVArh energy, Power Factor and kVA maximum demand, all preferable contained in a single compact housing, with minimum space requirements and standard connection block arrangement. The design of the meter shall be of a kind to provide maximum long-term stability, with minimum service requirements.

A built-in optical port (infrared data transmitting), RS232, RS485 and modem module with power supply shall be provided to enable direct communication to take place between the meter and a suitable external device. To accommodate for use in prepayment mode, a Customer User Interface (Keypad) is also a requirement.

The meter must have open protocol or if the meter is not compatible with CENTLEC AMR system the bidder must supply the protocols for integration to the AMR system.

The direct communication should include the following facilities:

- i. Reading all the meter registers;
- ii. Reading load survey data;

- iii. Scaling the meter for direct reading at specific current transformer and voltage transformer ratios;
- iv. Loading new off-peak and seasonal time of day tariff programs (not necessarily the same during week days and weekends);
- v. Resetting the internal meter clock;
- vi. Resetting the maximum demand registers (standard feature shall include automatic predetermined store and reset of MD and energy readings on a pre-set time monthly);
- vii. Reading instantaneous values such as voltage, current, power factor, etc.

Phase	Three
Voltage range	110 - 120V/220-240V(L-N)/380 - 415V (L-L)
Current range	Direct connected (5-150A), (5-250A) and (5-350A)
Frequency	50Hz
IEC approvals - Accuracy	IEC 62052:2003, 62053-21, 62052-23
IEC approvals - Ingress protection	IEC 60529:2004 (IP54 rating)
Product Life	15 years (10 years Certified)
Burden (Voltage)	1.15W, 2.8VA
Burden (Current)	2VA @ 150A/phase
Insulation	4kV RMS 50Hz
Impulse withstand	12kV 1.2/50 μ s, 40ohm source
Temperature - Operational	-25°C to +75°C
Temperature - Storage	-25°C to +85°C
Humidity	Annual Mean 95% (non-condensing)
Electronic	Yes
Dial	LCD
Class	0.5 or 1
Four Quadrant metering (VARh)	Yes
Register reset	Yes
Programmable	Yes

Inputs	No
Outputs	Yes (1, kWh)
Load Profile	Yes
Instrumentation Profiling	Yes
Ethernet Communication	Optional
RS232 Communication	Yes
RS485 Communication	yes
IrDA data	Optional
Internal/External Modem	yes
AMR/AMI capability	Yes
Data stream mode (fast data retrieval)	Optional
Event monitoring	Yes
Password protection	Yes
Time of Use Energy registers	Yes, 8 registers
Time of Use Demand registers	Yes (Minimum One)
Coincident Demand registers	Optional
TOU switching times	48
TOU seasons	12
TOU exclusion dates	32
Billing Dates (resets)	13
Historical sets	15
Deferred Tariff	Yes
Programmable Display	Yes
Programmable constants	Optional
Voltage imbalance monitoring	Optional
2 x VA registers	Yes
Reverse run detection	Yes, system & per phase
Customer registers	Yes (2 registers summing 2 internal values)
Read without power	Optional
Auxiliary voltage input	Optional
Calibration pulse	Yes

Display backlight	Yes
Import and export capabilities	Yes

Quantities to measure

- Import Wh
- Import Wh, Q1 and Q4 VArh
- Import Wh, Q1 and Q4 VArh, Import VAh
- Import/Export Wh
- Import/Export Wh, Q1, Q2, Q3, Q4 VArh
- Import/Export Wh, Import/Export VAh
- Import/Export Wh, Q1, Q2, Q3, Q4 VArh, VAh x 2
- 30min integration period for load profiles

7.1.4 MV/HV Meter – CT & VT Operated (kWh/kVA)

Phase	Three
Voltage range	57.5 - 240V (multi range)
Current range	5 - 6A or 1 - 1.2A or 10 - 100A
Frequency	50Hz
IEC approvals - Accuracy	IEC 62052-11:2003, 62053-21, -22, -23:2003,
IEC approvals - Ingress protection	IEC 60529:2004 (IP53 rating)
Product Life	15 years (10 years Certified)
Burden (Voltage)	1.12W, 2.45VA
Burden (Current)	0.12VA @ 5A/phase, 0.02VA@1A/phase, 0.2VA@100A/phase
Insulation	4kV RMS 50Hz
Impulse withstand	12kV 1.2/50μs, 50ohm source
Temperature - Operational	-20°C to +55°C
Temperature - Storage	-25°C to +70°C

Humidity	Annual Mean 75% (30 days spread over 1 year, 95%)
Electronic	Yes
Dial	LCD
Class	0.5 ,0.2
Four Quadrant metering (VARh)	Yes
Register reset	Yes
Programmable	Yes
Inputs	Yes (optional module - 4 inputs)
Outputs	Yes (4 on-board, programmable)
Load Profile	Yes (450 days, 1ch, 30min)
Instrumentation Profiling	Yes (separate set - 370 days, 1ch, 30min)
Ethernet Communication	Yes (optional module)
RS232 Communication	Yes (optional module)
RS485 Communication	Yes (optional module)
IrDA data	No
Internal Modem (Chip Sim)	Yes (CSD, GPRS)
AMR/AMI capability	Yes, via modem & pulse output
Data stream mode (fast data retrieval)	Yes
Event monitoring	Yes, 5 events
Password protection	Yes, 3 levels
Time of Use Energy registers	Yes, 32 registers
Time of Use Demand registers	Yes, 8 registers
Co-Indicent Demand registers	Yes, 5 registers
TOU switching times	96
TOU seasons	12
TOU exclusion dates	64
Billing Dates (resets)	36
Historical sets	36
Deferred Tariff	Yes
Programmable Display	Yes, 3 sets with free text
Programmable constants	Yes, CT & VT

Voltage imbalance monitoring	Yes
2 x VA registers	Yes
Reverse run detection	Yes, system & per phase
Customer registers	Yes (3 registers summing 5 values, internal & inputs)
Read without power	Option
Auxiliary voltage input	Option
Calibration pulse	Yes (Wh & VArh)
Display backlight	Option
Transformer loss compensation	Option
Open Protocol	Yes

Quantities to measure

- Import Wh
- Import Wh, Q1 and Q4 VArh
- Import Wh, Q1 and Q4 VArh, Import VAh
- Import/Export Wh
- Import/Export Wh, Q1, Q2, Q3, Q4 VArh
- Import/Export Wh, Import/Export VAh
- Import/Export Wh, Q1, Q2, Q3, Q4 VArh, VAh x 2
- 30min integration period for load profiles

7.1.5 Operational Requirements of meters

All the meters should be easily programmable to either operate as prepayment or post payment (Credit) meters with the software to be provided.

The following non-interval data shall be stored on the meter and it shall be able to be retrieved through remote communication

- i. Total energy;

- ii. Energy per Time-of-use period;
- iii. Status alarms to verify the integrity of the data.
- iv. Event recording:
- v. Tamper detection;
- vi. Supply outage
- vii. Over and under voltage;
- viii. The limit setting shall be configurable from $\pm 5\%$ to $\pm 15\%$ of nominal voltage, as a minimum;
- ix. An event shall be recorded if over and under voltage is sustained for a pre-defined period. This period shall be settable from 1 to 3 600 seconds;
- x. The date and time of the beginning of the event, and the date and time of the end of the event shall be stored;
- xi. For each under-voltage event, the minimum voltage that occurred during the period shall be recorded. For three phase meters, the phases affected shall also be recorded;
- xii. Disconnect / reconnect;
- xiii. Master station appliance (load) control override; and Meter configuration change.

7.1.6 General Information

	DESCRIPTION	ITEM 5.1.1 & 5.1.2	ITEM 5.1.3 & 5.1.4	ITEM 5.1.5
1.1	Manufacturer	_____	_____	_____
1.2	Country of origin	_____	_____	_____
1.3	Type of Meter	_____	_____	_____
1.4	Number of similar sold in the last five (5) years in South			

	Africa	_____	_____	_____
1.5	List of other local authorities and Municipalities with similar in use (specified separately)	_____	_____	_____
1.6	ESKOM approved (Yes/No) Certificate No.	_____	_____	_____
1.7	SANS approved (Yes/No) Certificate No.	_____	_____	_____
1.8	Protocol supported by meter (e.g., FLAG, Chirps, DLMS, COSEM, etc.)	_____	_____	_____

7.1.7 Communication

- a) The communication network will be a combination of the CENTLEC's Fibre Optic network from the Server (LAN)/Power Station to all the Distribution Centres (fibre optic communication) on the network.
- b) The system shall support different transmission networks for communicating with the meters and collecting data from them. The

system shall support the following communication media:

- I. GSM 900/GPRS (Global System for Mobile Communications)
 - II. GSM 1800/GPRS
 - III. GPRS/3G (General Packet Radio Service / 3G – video calls, browsing Internet)
 - IV. GPRS/5G
 - V. TCP/IP (Transmission Control Protocol and Internet Protocol)
 - VI. ADSL (Asymmetric digital subscriber line)
 - VII. LTE (Long Term Evolution, 4G mobile communication standards)
- c) The system shall communicate with meters using internationally recognized standards and communication protocols, such as:
- I. DLMS/COSEM (IEC 62056) - mandatory (Device Language Message Specification / Companion Specification for energy metering) Standard for electricity metering data exchange
 - II. IEC 1107 (EN61107) – mandatory
 - III. SCTM – optional
 - IV. FNP – optional
 - V. IEC 870-5-102 – optional
 - VI. Mod Bus RTU
 - VII. DNP3

7.1.8 Customer Interface Unit (CIU) – Requirements

- I. The CIU should be inter-changeable with other meters (1-phase and 3-phase).
- II. The graphical display shall be able to display messages of 255 characters.

- III. The customer interface unit shall incorporate coloured indicators to indicate the active tariff rate.
- IV. Buttons shall be provided for to allow for navigation of the information (Buttons must be rugged-made of silicon rubber)
- V. The customer interface unit shall allow a communication/setup interface to configure the display with the correct meter information.
- VI. The digits of the values must be at least 4mm in height.
- VII. It is preferable that the CIU display be capable of being read in the dark.
- VIII. The display unit shall be capable of functioning after the meter has disconnected with the electricity supply.
- IX. The communication between the meter and the customer interface unit shall be via power line or communication wire.
- X. The unit shall display the appliance switching status of the meter. The unit shall be capable to graphically display consumption and cost graphs for daily, weekly and monthly values.
- XI. CIU's **must** have a three (3) years manufacturers guarantee delivered with each batch. Failure of CIU in the guarantee period will constitute replacement by the supplier at no cost to CENTLEC.
- XII. CIU's must comply with at least IP53 rating.

Display Information on CIU

Display information	Meter display	Customer interface unit
Meter identification number (serial number)	Yes	Yes
Date and time	Yes	Yes
Off peak kWh (import)	Yes	Yes
Peak kWh (import)	Yes	Yes
Total kWh (import)	Yes	Yes
Off peak kWh (export)	Yes	Yes

Peak kWh (export)	Yes	Yes
Total kWh (export)	Yes	Yes
kVArh quadrant 1	Yes	Yes
kVArh quadrant 2	Yes	Yes
kVArh quadrant 3	Yes	Yes
kVArh quadrant 4	Yes	Yes
Current demand (kW)	Yes	Yes
Interval energy consumption (kWh)	No	Yes
Current tariff period	Yes	Yes
Energy cost (current billing month)	No	Yes
Energy cost (previous interval)	No	Yes

7.2 METER MEMORY READER / GRAB TESTER – DIRECT ON LINE METERS

The Meter memory reader/grab tester should have the ability to read the memory of a meter when operating on prepayment mode and extract the last reading of the kWh units on the meter. This function should still be effective when the meter display is faulty and when the meter has suffered damage, which renders it redundant for use on electrical installations.

7.2.1 General characteristics:

- a. Portable/Handheld device
- b. LCD display
- c. Battery powered and rechargeable

- d. Charging port
- e. Scan detector
- f. Infra-red enabled
- g. Durable keypad with backlight
- h. Flashlight
- i. Communication port
- j. Buzzer
- k. Laser Scanner (min. 58 times/sec scan rate)
- l. 2-colour LED's
- m. 1.5m drop impact strength

7.2.2 Technical characteristics:

CPU	Embedded
ROM	Min. 512 KB
RAM	Min. 512 KB
FLASH	Min. 64 MB
Font Library	Min. 16×16 dot matrix
Display	Min. 128×128 with backlight
Operating Temperature	-20°C to 60°C
Battery	3.7V rechargeable lithium battery
Communication	1×Serial port & 1×standard infrared port
USB interface	IrDA communication port
IP rating	IP65

7.3 CHIP SIM MODEM SPECIFICATION

Hardware Specifications

- Meter Powered.
- 2 x RJ11 Ports (1 x RS485, 1 x RS232).
- RS485 and RS232 Daisy Chain Capability.
- GSM/GPRS/EDGE/CSD.
- Power Supply for specific meters

Environmental Specifications

- Operating Range: -30°C to +75°C.
- Relative Humidity: Up to 90% noncondensing for 30 days.

Software Specifications

- GPRS and CSD.
- APN, TCP Client and Server operation.
- AT commands via SMS.
- OTA (Over the Air Firmware Updates).
- Auto Detect registration on dual SIM.
- Software Watchdog Functionality.
- Proven Reliability

ICASA Approved

- Module should be ICASA approved

8. SPECIAL CONDITIONS

- I. Local office for more than three years to prove sustainability and not just an address to show locality.
- II. Warranties of a minimum of one (1) year on all meter-related equipment including modems and customer user interface, etc.
- III. The successful bidder must submit all warranties and guarantees from the manufacturer.
- IV. Suppliers must provide CENTLEC with a device that has the ability to read the meter memory even when the display is broken or damaged, and full access to interrogate the meter and any other readings from the meter.
- V. The bidder should provide the software from the supplier to program and read the meters.
- VI. Certification of the meters especially the CT meters.
- VII. Assist technically with the modem setup and communications modules.
- VIII. Specified delivery times on an order, 4 to 6 weeks from placing the order.

- IX. The supplier must be able to prove the accuracy of a meter installed if the need arises, maybe as an extra service, by physically testing the installation.
- X. Full access to the protocol as and when needed for integration purposes.
- XI. Training and technical support during the 3-year contract term.

9. SPARES LIST

- 9.1 Customer Interface Unit – Nyamezela 150A Three Phase Four Wire Smart Metering Cabinet (DTZ 1513)
- 9.2 2S1B (Kocos Chip Sim Modem) – Elster A1700, A1140 & A1160 Meters
- 9.3 Power Supply – 2S1B Kocos Chip Sim Modem

10. EVALUATION CRITERIA

All proposals submitted will be evaluated in accordance with the criteria set out in the policy of Supply Chain Management of the Entity.

The most suitable candidate will then be selected. Please take note that CENTLEC (SOC) Ltd is not bound to select any of the firms submitting proposals.

Furthermore, technical competence is the principal selection criteria, CENTLEC (SOC) Ltd will evaluate the technical criteria first, and will only look at the price and BBBEE level of contribution if it is satisfied with the technical evaluation. Because of this, CENTLEC (SOC) Ltd does not bind itself in **any way** to select the firm offering the lowest price.

The relative technical weighting of the criteria is as follows:

10.1 EVALUATION TABLE

No.	Criteria	Description	Points
1.	Track record and experience	Have they provided these services in the last four years? A maximum of 3 reference letters of confirmation is required. a) Two (2) letters = 10 points b) Three (3) letters = 20 points	20
2.	Local (Mangaung) operational capability and economic investment	Does the bidder have a business address in the Mangaung Metropolitan area? = 10 points If not = 5 points	10
3.	Quality and compliance to requirements as specified in the technical specifications	Submit proof of SANS certificates as per point no.4 above = 10 points Eskom certification on each item to be supplied = 5 points	15
4.	Bidders should present a list and live presentation of their equipment	Samples to be supplied on request to CENTLEC evaluation committee: a) Can supply Time-of-Use Direct Online (100A) and CT Operated Meters (5A) with their Chip SIM Modems = 15 points	55

No.	Criteria	Description	Points
		<p>b) Direct On Line meters can operate on Postpaid and Prepayment Mode = 10 points</p> <p>c) Can supply Direct On Line meters rated from 150A to 350A that can operate on Postpaid and Prepayment mode = 10 points</p> <p>d) Can supply Chip SIM modems for existing meters = 10 points</p> <p>e)Where applicable, CIU able to communicate with the meter when power is off = 5 points</p> <p>f) CIU interchangeable between meters = 5 points</p>	
	TOTAL		100

A bidder who gets a minimum of 85 points and above on will qualify to the next stage. Individual tenders would have to be evaluated according to the preferential point system. The bidder must score minimum points as follows:

Item 1 – 10 points

Item 2 – 5 points

Item 3 – 15 points

Item 4 – 55 points; in the Evaluation Criteria.

The point system applicable to this project will be 80/20

10.2 PRICE AND REFERENTIAL POINTS SCORING – STAGE 2

(Price and B-BBEE status)

All Bidders that have passed the technical evaluation threshold of 85 points would also be scored based the 80/20 principle where 80 Points is for the Price and 20 points for B-BBEE as per the detail given below

10.2.1 Points awarded for price

A maximum of 80 Points is allocated for price on the following basis:

Where,

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

P _s	=	Points Scored for comparative price of
bid		under consideration
P _t	=	Comparative Price of bid under consideration
P _{min}	=	Comparative Price of lowest acceptable bid

10.2.2 Points awarded for B-BBEE Status Level of Contribution

In terms of Regulation 5(2) and 6(2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below;

B-BBEE Status Level of Contributor	Number of Points (80/20 System)
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-Compliant Contributor	0

11. PRICING

All bidders should develop their quotation using the following pricing schedule:

Table 1 – Price schedule

PRICE SCHEDULE FOR (TOU) SMART METERS				
[all prices are per TOU smart meter and exclusive of VAT]				
ITEM NO.	DESCRIPTION	Manufacturer and item code	Lead time for delivery (weeks)	COST PER ITEM (RANDS)
5.1.1	Directly connected Single-Phase kVA/kWh Smart Meter (5 to 100A)			
5.1.2	Directly connected Three-Phase kVA/kWh Smart Meter (5 to 100A)			
5.1.3 (i)	Directly connected Three-Phase kVA/kWh Smart Meter (5 to 150A)			
5.1.3 (ii)	Directly connected Three-Phase kVA/kWh Smart Meter (5 to 250A)			
5.1.3 (ii)	Directly connected Three-Phase kVA/kWh Smart Meter (5 to 350A)			
5.1.4	MV/HV Meter – CT & VT operated (kWh/kVA)			
5.1.5	Customer Interface Unit (CIU) - Requirements			

PRICE SCHEDULE FOR (TOU) SMART METERS				
[all prices are per TOU smart meter and exclusive of VAT]				
5.2	Meter Memory Reader / Grab Tester – Direct On Line Meters			
5.3	SIM Chip Modem			
8.1	Customer Interface Unit – Nyamezela 150A Three Phase Four Wire Smart Metering Cabinet (DTZ 1513)			
8.2	2S1B (Kocos Chip Sim Modem) – Elster A1700, A1140 & A1160 Meters			
8.3	Power Supply – 2S1B Kocos Chip Sim Modem			

12. CONTACT INFORMATION

12.1 For any further technical information regarding the document contents please, contact Ms. Moipone Mokanyane e-mail: moipone.mokanyane@centlec.co.za or Mr. Simphiwe Sixeki at simphiwe.sixeki@centlec.co.za. Such queries must be done in writing; the email address provided serves this purpose. The answer to one question will be sent to all the other prospective bidders that have bought the bid documents.

12.2 For Supply Chain related questions, please contact Ms. Palesa Makhele at 051 412 2753 or at Palesa.Makhele@centlec.co.za