



ANNEXURE A: TECHNICAL SPECIFICATION REQUIREMENTS RT29-2024

**AUDIT AND TID CONVERSION OF EXISTING PREPAYMENT
METERS AND THE SUPPLY, DELIVERY, INSTALLATION,
MANAGEMENT, AND MAINTENANCE OF SMART METERING
SOLUTION FOR A PERIOD OF THIRTY-SIX (36) MONTHS**

SCOPE OF SERVICES/ TERMS OF REFERENCE

1. PURPOSE

- 1.1. The purpose of this section is to articulate the National Treasury's requirements for the services for the auditing of existing prepayment meters, associated TID conversion of these meters, and the supply, installation, management, and maintenance of the smart metering solution for a period of three (3) years.

2. SCOPE OF TENDER

- 2.1. The municipality is looking for the best cost-efficient solution to effectively manage the smart metering solution. The solution needs to, at a very minimum, cater to the current business processes of the Unit dynamically and seamlessly; however, the solution is not limited to these business processes, and innovation is encouraged.

The Service Provider must, at a minimum, provide the following:

Line #	Requirement	Details Requirements
1	Smart Metering Solution	<ul style="list-style-type: none">• Installation of smart metering solution.• Management of the smart metering solution.• Maintenance of the smart metering solution.• The smart metering system must comprise an electronic.• Interrogation and transfer of data from the field installation over a communications network to a metering database preferably on-site with a suitable backup.• Successful bidder must provide accredited training to municipal staff.• The dashboard and all functions available to be made available to MUNICIPAL staff.• Seamless Integration of the smart metering Billing register data into MUNICIPAL• Financial System in line with the SCADA legislation, as well as any other system that might require integration.

1.1	Automated Meter Reader System	<ul style="list-style-type: none"> • Limited or no human intervention from data collection from the meter to data dumping on the billing file. • Collect, process, monitor, publish consumption, and profile data daily for all metering points. • Continued configuration and mapping of existing services with relevant departments. • Continued development of functionality in line with existing infrastructure. • Continued development of new functionality in keeping up with modern technologies. • Standard operating procedures when required. • Backup schedules. • Be process-driven; these processes will be defined by the municipality. • Comply with the supply authority's processes and functionality as defined at the briefing session. • Accommodate changing Business Rules. The current Business Rules will be given to the successful bidder. • Roll out campaigns at regular intervals to update customer information, based on specific Business Rules. • Full integration to the supply authority's financial system which inter alia synchronises all account information daily. • A web portal allowing consumers to view their water and electricity consumption. • Communication layer across multiple network service providers
1.2	Meter Data Collector	<ul style="list-style-type: none"> • The data must be collected regularly or as and when required for analysis. • For a load data profile: a 30-minute Active and Reactive Energy, kilo-Volt-amps, and Power Factor should be updated once every 24 hours. • Meter event log be submitted to supply authority once every 7 days. • Phasor diagrams must be available with immediate effect.
1.3	Support and Maintenance	<ul style="list-style-type: none"> • Manage the Query Resolution Centre by allowing for queries to be logged internally and externally and manage and track these queries until resolution, with the necessary built-in-escalations. • Allow reference numbers to be allocated for all logged calls and queries. The reference number must be SMS'd and emailed to the customer where valid cell phone numbers and email addresses exist. • Allow for pre-defined ad hoc SMSs to customers notifying them of the status of their inquiry.

1.4	Management Dashboard	<ul style="list-style-type: none"> • Allow management and technical team to view real-time installations. • Dashboard and all functions available to be made available to supply authority's staff.
2	Technical Smart Electricity Metering	Include CVs of a minimum of permanently employed technical staff members with at least three completed years' experience in the support and maintenance of a SMART METERING SOLUTION system; as well as the CV of Onsite Support staff members with a minimum of three completed years' experience in the support and maintenance of a SMART METERING SOLUTION system

3. TECHNICAL SPECIFICATION

All supplied meters must comply with local content requirements as per the Department of Trade and Industry.

3.1. **SMART ELECTRICITY**

- 3.1.1. The entire time-of-use tariff reading and billing process, as well as several kVA tariff and statistical meters be provided by the service provider. In addition to the meter reading function, it is the supply authority aims to provide an excellent and transparent service to its time-of-use and other large power users by displaying pertinent billing and technical information on the internet, both accurately and timeously.
- 3.1.2. The successful bidder will assume responsibility for the integrity of the metering installation which includes the new meter and wiring but excludes current transformers, voltage transformers, fuses, and test blocks.
- 3.1.3. Software protocols and keys must be able to communicate to any electricity meter installed in the supply authority's boundaries.
- 3.1.4. Meters must be programmable to record and report billing data for various tariff groups such as Time of use, MV consumers, small business consumers, etc.
- 3.1.5. Meters shall be programmed to store the maximum average over 30 minutes of demand in kVA recorded during the billing period.
- 3.1.6. Meters shall have the capability to log both import and export energy.
- 3.1.7. Meters shall be both STS and CTS enabled.
- 3.1.8. Communication infrastructure for electricity meters should be via the service provider's APN.
- 3.1.9. The hybrid solution to be implemented to allow business continuity for the Municipality. The Application and Database shall be installed on separate servers.
- 3.1.10. The Entity Relationship (ER) Diagram structure is to be provided.
- 3.1.11. All personnel that will work on any smart electricity metering installation of the municipality must be an authorized person with at least an Operating Regulation for High Voltage Systems (ORHVS) and must be a certified meter installer (with meter certification issued by a SETA accredited service provider) as described in NRS057, proof of certification of such person/s must be submitted with this tender document. Failure to submit proof will be deemed as non-responsive.

3.2. SMART WATER

- 3.2.1. The smart water meters with electronic indicators must comply with SANS 1529 Part 9: Important requirement of SANS 1529 requires that for households, meters installed outdoors must be durable. Preferable smart water meters are plastic meters and must be protected against sunlight and corrosion.
- 3.2.2. Smart water meter devices be pulse port readers.
- 3.2.3. Smart water conventional meter may be a stand-alone meter or an advanced meter itself. The reading of a conventional smart water meter needs to be converted into a signal that the advanced meter can record.
- 3.2.4. Smart water meters should be able to withstand reverse flow without any damage to the normal operational parameters. The maximum permissible relative errors of new smart meters should be 5% in the lower zone, which is between the minimum (q_{min} or $Q1$) and transitional flow (q_t or $Q2$) rates, and 2% in the upper zone, which is between the transitional and overload (q_s or $Q4$) flow rates.
- 3.2.5. AMR capabilities specification is as follows:
 - a) Maximum flow range of one pulse per second
 - b) Built-in radio communications
 - c) Sigfox
 - d) Embedded antenna
 - e) Class 0
 - f) ABS plastic housing
 - g) Easy mounting: vertical or horizontal
 - h) Tested to IP68 waterproof rating (bidder to produce the proof)
 - i) Power source: lithium battery rated for an approximate life of 10 years, dependent on usage.
 - j) ICASA ETSI EN 301 489-1 and 3
 - k) ICASA ETSI EN 300 220

3.3. SYSTEM OUTPUTS

- 3.3.1. Required billing information.
 - a) Total active energy consumed in the billing period.
 - b) Total reactive energy consumed in the billing period.

- c) Total energy consumed for each time-of-use period (peak, standard and off-peak). This shall be calculated by applying the current Local Municipality tariff to the load profile data received for each customer.
 - d) Maximum average per 30-minute period demand as recorded in the relevant time-of-use periods applicable to each customer.
 - e) Data be forwarded through to the supply authority's billing system seamlessly.
- 3.3.2. Start and end register readings for total active and reactive energy for the billing period.
- 3.3.3. In some cases, a successful bidder may be required to provide energy in terms of start and end readings as opposed to consumption. In these cases, the service provider shall create pseudo registers to contain start and end readings for energy consumed in each time-of-use period.
- 3.3.4. Successful bidder to ensure that the correct tariff is applied to each consumer as provided by the municipality.

3.4. **ALARMS**

- 3.4.1. All smart meters are to be automatically monitored 24/7/365 for irregular activities and the system must trigger an alarm for any tampered meters. A system-generated notification be sent to the supply authority's responsible personnel on any identified meter tamper alarm.

3.5. **TESTING AND CERTIFICATION**

- 3.5.1. All meters shall be tested by the successful bidder for accuracy of the complete metering installation, and a test certificate for each metering point be submitted to the municipality. Also, a commission report is to be submitted to the supply authority for each installation by a successful bidder. The commission report should have the following data:
- Physical address
 - Picture of a meter- Indicate Brand name, kWh, and kVA.
 - Picture of seals
 - Seals serial numbers
 - Picture of meter enclosure, kiosk
 - Picture complete installation or an audit
 - GPS coordinates of a meter
 - Circuit breaker size.
 - CT Ratio.

- VT ratio where applicable.
- Modem information that includes, manufacture, make, model, and serial number.
- Picture and details of installer/auditor.
- Measure phase voltage and currents on all phases and
- An addition of comments/remarks where necessary.

3.5.2. Certification

3.5.2.1. Successful bidders should submit:

- a) Valid test report/certificate issued by SABS for its smart meters and related smart devices.
- b) DLMS certification o For Smart metering - and more generally, smart devices - needs a globally accepted standard language that ensures interoperability, efficiency, and security.
- c) ICASA certification
- d) Sigfox
 - Either manufacturer or operator, the successful bidder needs to ensure cost-effective and safe use of your electrical and water installations and power plants.
- e) STS certification
- f) G3 PLC Certification
- g) Valid Electrical Contractor Certification as issued by the Department of Labour
- h) Valid company SETA accreditation certificate for all its trainings.
- i) Certification of assessor
- j) Electricity meters and smart metering equipment to comply with NRS049:2016 minimum standards.

4. SYSTEM SPECIFICATION

4.1. Software Requirements:

- 4.1.1. The Smart Metering Solution is to be supported with the latest fully licensed operating system. The licensing is to be extended to any SMART METERING SOLUTION client installed on any of the supply authority's computers and/or servers.
- 4.1.2. Provide a web interface for the Smart Metering with single-user sign-on.

4.2. Governance:

- 4.2.1. The supply authority's ICT has adopted and conforms to the following best practices and standards to ensure compliance:
 - a) Control Objectives for Information and Related Technology (COBIT) Framework
 - b) Information Technology Infrastructure Library (ITIL)
 - c) International Organisation for Standardisation (ISO) (ISO 9000)
 - d) Municipal Standard Chart of Accounts (SCADA)

4.3. Security standards:

- 4.3.1. The ICT security landscape of MUNICIPAL is guided by international best practices.

4.4. Database environment:

- 4.4.1. The ICT has adopted an MS SQL database, which integrates easily with other applications/systems. The MS SQL 2016 database is to be utilized.

4.5. User Interfaces (GUI):

- 4.5.1. The supply authority's web browser landscape consists of;
 - Internet Explorer
 - Mozilla Firefox
 - Google Chrome

4.6. Network environment:

- 4.6.1. The supply authority currently has sites scattered throughout that make use of a secure Internet Protocol (IP) Private Network to facilitate communications.

4.7. Server environment:

- 4.7.1. The server environment refers to the supply authority's server administration functionality as outlined in applicable ICT policy.

5. SYSTEMS INTEGRATION

- 5.1. Critical to the overall success of the project is the integration of the Smart Metering Solution to the MUNICIPAL Financial System in line with the SCADA legislation, MUNICIPAL's Website, as well as any other system that might need integration.

6. STANDARD OPERATION MANUALS

- 6.1. The standard operation manuals and backup schedules of the Smart Meter Solution and configuration of equipment together with the detailed diagram of the design must be made available. The manuals must be available in hard copy and electronic format.

7. TESTING

- 7.1. The Smart Metering System must be tested in the MUNICIPAL environment after installation to ensure that the system is operating as per the tender specification.

8. TRAINING & ADMINISTRATION

- 8.1. The successful bidder shall be responsible for providing onsite training to all staff within the affected departments as well as to selected staff from the ICT Department. The training must be done by a SETA-accredited service provider; likewise, all trained MUNICIPAL staff members must be issued with a certificate after completion.
- 8.2. The successful bidder shall create a Standard Administration and Maintenance Procedure for the solution provided.

9. MAINTENANCE CONTRACT

- 9.1. The services to be rendered through this contract will be as follows:
- Support and maintenance
 - Preventative maintenance
 - Remote support 24/7
 - Onsite support from Monday to Friday, commencing at 08h00 until 16h30
 - Telephone support
 - Upgrade services
 - Enhancement services (such as, but not limited to, amendments to reports, new reports, etc.)

- Consulting services
- Patches updates
- Product applicable licenses

9.2. The bidder is responsible for the cost of all annual licenses and licenses are to remain valid for the duration of the contract.

9.3. **The incident logging will be managed as follows:**

9.3.1. The user department will log the calls to the internal ICT department and will assign the fault to the onsite resource for action or escalate the faults to the service provider when needed.

9.3.2. **The calls logged will be categorized as follows:**

Priority	Fault Severity	Description
1	CRITICAL	The smart meter (water or electricity) is not functioning (No communication from the meter to the system) – high impact on billing/revenue management and protection unit.
2	HIGH	Processing can continue – circumvention acceptable in the short term
3	MEDIUM	Processing can continue – acceptable circumvention
4	LOW	No impact on the processing
5	ENHANCEMENT	Request for additional functionality

9.3.3. The response and resolution times are expected to be as follows:

Priority	Description	Response	Resolution times	Penalties
1	CRITICAL	Respond within thirty (30) working minutes	Best effort to resolve within two (2) working hours	<p>Failure to comply with expected response times will be charged R500.00 per 30 minutes per incident.</p> <p>Failure to comply with expected resolution times will be charged R1000.00 per 2 hours per incident</p>
2	HIGH	Respond within thirty (30) working minutes	Best effort to resolve within three (3) working hours	<p>Failure to comply with expected response times will be charged R500.00 per 30 minutes per incident.</p> <p>Failure to comply with expected resolution times will be charged R1000.00 per 3 hours per incident</p>
3	MEDIUM	Respond within one (1) working hour	Best effort to resolve within four (4) working hours	<p>Failure to comply with expected response times will be charged R500.00 per 60 minutes per incident.</p> <p>Failure to comply with expected resolution times will be charged R1000.00 per 4 hours per incident</p>
4	LOW	The solution may be implemented in future releases		

Priority	Description	Response	Resolution times	Penalties
5	ENHANCEMENT	Quotation for enhancements and procurements of new equipment will be supplied with milestone dates for additional functionality and both parties will have to agree		

10. PRESENTATION BY BIDDERS

- 10.1. During the evaluation process, shortlisted bidders will be invited to demonstrate the capabilities of their proposal, as set out in their tender documents. All costs relating to tendering, presentations, and demonstrations to be held (Please see the SCC) will be at the tenderer's cost. The demonstration will be based on the requirement of the scope of service. Further details will be provided to the short-listed bidders.

11. CLOUD SERVICES

- 11.1. The signed service level agreement between the appointed service provider and municipality requiring the service must identify the cloud service to be used for data storage and disaster management data recovery processes.

12. CUSTOMER CARE

- 12.1. Support and Maintenance are to be conducted locally during office hours (08h00 to 16h30 from Monday to Friday excluding public holidays). Remote support must be available after hours 24/7 including weekends and public holidays.

13. VALUE ADDED SERVICES

- 13.1. Bidders must submit the list of value-added services on the pricing schedule. The information must clearly indicate unit of measure and outline the details of the value-added services in a separate document. The State reserve the right not to accept any of the proposed value-added services.