



Request for Proposal: Advanced Metering Infrastructure

January 24, 2019

The Town of Tarboro is seeking proposals for an Advanced Metering Infrastructure Project. The system must provide a cost effective means to enhance service delivery to the community in which we serve.

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1. TOWN OF TARBORO BACKGROUND

1.1 Overview of RFP

The Town of Tarboro is issuing this Request for Proposals (RFP) to solicit proposals for an Advanced Metering Infrastructure (AMI) Project to include the following functional areas:

- Advanced Metering Infrastructure (AMI) for electric and water meters;
- Head-end system required to operate AMI;
- Communications Infrastructure (Backhaul and Field Area Network for full two-way communications infrastructure for both AMI); this infrastructure may consist of both utility deployed/owned systems as well as combinations of public infrastructures such as cellular, internet, etc.;
- Meter Data Management System (MDMS);
- Utility Portal;
- Voltage Monitoring;
- Outage Notification;
- Remote Connect/Disconnect Availability;
- Prepayment Services;
- End-use Customer Portal; and
- System Integration with existing Utility SCADA, CIS/billing systems, GIS, IVR, and/or OMS as applicable

Prospective vendors are encouraged to submit proposals in one or more, or all of the functional areas listed above.

It is requested that each Bidder identify the specific functional area(s) for which it is submitting a proposal; provide a technical overview and capability of its product and service offering for each functional area, a description of project management, implementation, system integration services, training, and/or any on-going operation and maintenance service that is part of its proposal; and a pricing structure model to provide its products and services to the Town.

The Town of Tarboro will be the purchaser of any equipment or services through this process.

All proposals shall become the property of the Town. This RFP is solely an invitation to submit proposals, not an offer to establish any contractual rights. Bidders shall be responsible for all costs and issues associated with delivery of their proposals.

The Town of Tarboro reserves the right to:

- reject or accept any or all proposals received in response to this RFP for any reason or no reason;
- reject or accept any incomplete proposals;
- waive any minor irregularities or minor errors in the proposals received;
- reject the proposal with the lowest price;
- request clarifications from Bidders;
- conduct simultaneous negotiations with multiple Bidders; and
- modify its requirements due to any regulation or legislation.

Responses to this RFP are made without recourse to the Town for either rejection or failure to enter into a binding commitment for any reason whatsoever or no reason.

1.2 Objectives of RFP

Two ways to describe the AMI solution(s) that the Town will select are: robust and cost-effective. The selected solution(s) must be robust, providing the expected level of service, interoperable with other system components and backed by a stable company that is experienced in delivering services to the municipal utility industry.

A standard solution may consist of a suite of products and services from the identified functional areas in Section 4 or a menu of products and services that can be implemented by the Town to achieve desired results.

The Town is planning to select a cost-effective solution. However, the Town is not only considering cost in its evaluation but also the total value proposition.

The Town is aware that project management, implementation services, financial and/or on-going system operation and maintenance may also be a factor in selecting proposed products and services.

1.3 About the Town of Tarboro

The Town of Tarboro is located along the banks of the Tar River in eastern North Carolina and is home to approximately 11,000 citizens.

The governmental structure is a Council-Manager form of government with 200 full and part-time employees. The Town operates under the following departmental structure: General Administration (including Human Resources), Finance, Planning & Inspections, Police, Fire, Public Works (Water and Sewer,

Sanitation, Streets, etc.), Electric, and Parks & Recreation. The Town offers Electric, Water and Sewer, and Sanitation as enterprise services to its citizens. It is currently managed through a collective budget of approximately \$40 million.

The Town provides electric and water services to approximately 6,500 customers in total. However, not all customers are provided with both services, and there are some water areas that are not within the electric service territory that will be included in this AMI project.

1.4 Volume

The Town realizes that the products and services requested in this RFP may be met by a variety of suppliers and various contract structures and terms, which, in combination, may provide the greatest value to the Town. The Town reserves the exclusive right to purchase or not to purchase the products and services that might be offered through this RFP.

Once the responses to the RFP have been evaluated, the Town reserves the right to clarify its understanding of proposals at a greater level of detail, including specific pricing, performance guarantees, financing alternatives, service and maintenance agreements, etc.

1.5 Schedule

The RFP schedule, subject to change at the Town's discretion, is as follows:

Town of Tarboro RFP for Advanced Metering Infrastructure – Schedule	
Issue RFP	01/24/2019
Intent to Respond	02/11/2019
Final RFP Questions Received	02/15/2019
Proposal Due Date	02/21/2019
Clarifications and Negotiations with Selected Bidders	March 2019
Execution of Definitive Agreement(s)	Mar-Apr 2019

1.6 Term of Agreement

In the event that a Bidder proposes any ongoing service in response to this RFP, a 10-year term is preferred by the Town for such a service agreement.

1.7 Pricing and Delivery

All proposals must contain pricing and delivery information. Proposals may be held by the Town of Tarboro for a period not to exceed one hundred and twenty (120) days and shall remain valid for that same period from the date of the bid opening for reviewing the bids and investigating the bidders' qualifications prior to the contract award.

2. SUBMITTING PROPOSALS

Any communications related to this RFP shall be directed to:

Town of Tarboro
Anne Mann, Finance Director
500 N Main Street
Tarboro, NC 27886

All questions and requests for clarification should be made in writing, preferably by email to AnneMann@Tarboro-NC.com and should refer to the "RFP FOR AMI PROJECT". Tarboro in its sole discretion, will decide whether and how a response will be made.

We also ask vendors to submit an Intent to Bid by email to AnneMann@Tarboro-NC.com by Monday, February 11, 2019. Vendors providing the intent to bid will be included on communications for any Addendum and answers to any questions or clarifications to the RFP.

2.1 Evaluation Process

The evaluation of proposals will be based on the information provided by the Bidder. A complete response to the information requested in this RFP is requested so that the Town can evaluate all of the options that are available. The Town may also require the Bidder to include demos of all equipment. The Town reserves the right to negotiate with one or more Bidders to improve their proposals, although selection for negotiation will not be a commitment by the Town to enter into a contract with any Bidder.

2.2 Proposal Format

Appendix A outlines the format Bidders are to use in responding to the RFP. Bidders should provide a response to each of the line items, even if the answer is "does not apply."

2.3 Assessment Criteria

The Bidder's response to this RFP is intended to help the Town of Tarboro select the technology and support services that provide the best solution to its AMI project. Proposals will be evaluated using a number of factors including:

- Compliance with the requirements
- Unique advantages of solution
- Best fit for the Town's budgetary and operational needs, both currently and in the future
- Vendor's experience providing such solutions and customer references
- Total cost to deploy proposed solution
- Total cost to maintain the system over its lifetime
- Availability and delivery schedule
- Training
- Versatility and projected lifespan of proposed technology

2.4 Proposal Content and Submission

Bidders should (i) provide the information requested in Sections 3 and 4; and (ii) include all required supporting documentation in order for their proposals to be given consideration by the Town. Multiple proposals from a single Bidder, or multiple versions of one proposal, must be submitted as separate proposals.

A hard copy and an electronic version of all proposals must be submitted and received by Town no later than 10:00 am local time on Thursday, February 21, 2019. All proposals will become the property of the Town. The Bidder is solely responsible for any and all costs it may incur in responding to this RFP, including those associated with any subsequent negotiations or discussions.

2.5 Confidentiality

Trade secrets or similar proprietary data which a Bidder does not wish to be disclosed other than to representatives of the Town of Tarboro involved in the evaluation of its proposal will be kept confidential to the extent permitted by N.C. Gen. Stat. § 132-1.3 if identified as follows: Each page shall be identified in boldface at the top and bottom as "CONFIDENTIAL." Any section of the proposal that is to remain confidential shall also be so marked in boldface on the title page of that section. In spite of what is labeled as confidential, the determination as to whether or not such information may be kept confidential shall be governed by North Carolina law.

3. **ADVANCED METERING INFRASTRUCTURE PROJECT OBJECTIVES**

Listed below are the AMI Project's objectives. Each Bidder's response should thoroughly address how well the proposed solution can meet these objectives.

- Two way communications support for the following services:
 - Electric and Water meters (including water-only service areas)
 - Grid Monitoring
 - Outage and Restoration Notification
 - Voltage Monitoring

- Customer service and satisfaction:
 - Provide scheduled reads and accurate billing
 - Provide on request reads
 - Provide remote service disconnect/reconnect
 - Provide remote pings and power status checks
 - Provide prepayment service option
 - Provide mobile applications for customer control, bill pay, etc.
 - Provide customer portal with detailed usage and cost information

- Reduce total cost of ownership, to what level the system can:
 - Provide firmware upgrades to AMI meters, Smart Thermostats, In-Home Displays, etc.
 - Provide firmware upgrades for the communications infrastructure components such as upgrading protocols, etc.
 - Monitor and report losses due to tampering or leaks
 - Manage and reduce network infrastructure assets
 - Use common communications platform for AMI, Distribution Automation, etc.

- Improve forecasting by collecting data:
 - Load profile
 - Peak demand
 - Bi-directional net metering
 - Power flow measurements on distribution transformers and feeders

- Provide a solution designed with end-to-end security:
 - Provide enhanced encryption and authentication
 - Support role based access
 - Provide audit logging and reporting
 - Provide WAN options that support ANSI C12.22 standards

- Protect against obsolescence and promote interoperability
 - Provide support for walk-by/drive-by one way mobile systems based on communications systems that can remotely transition to a full two way smart grid solution without having to make local site visits to the field devices
 - Provide a system design based on open industry standards (including IEEE 802.15.4g) for the neighborhood area network (NAN)
 - Provide standard WAN interfaces
 - Provide support for multiple concurrent communications options
 - Provide flexible data exchange using industry standard XML, Service Oriented Architecture Protocol and/or MultiSpeak.
 - Notify and stream collected data to GIS, MMS, MDM, DRMS, CIS/Billing, OMS, Prepayment and SCADA systems (explain methodology, process, and requirements)
 - Provide scalability for additional bandwidth and capacity.

4. MINIMUM FUNCTIONAL REQUIREMENTS

The minimum requirements are listed below. The following areas are to be covered. You are requested to respond to each section as:

- Comply
- Not comply (provide future date or explanation)
- Alternative (provide detailed explanation)

In some sections a detailed explanation may be requested instead. Please respond to these as requested.

4.1 Architecture

Design should support integration with the Town's Logics billing system. Please explain the integration process that will be taken with the Town's billing system, and state if you have integrated with Logics Phoenix in the past.

Design should support distributed intelligence with flexible path routing and configurable message prioritization. Data shall be stored at every level of the network according to user designed rules. It shall be highly scalable and support a unified multi-technology platform using standards-based communications options that can be used in the same deployment. The system shall allow for the easy addition of system bandwidth in order to increase data throughput and must be optimized to handle high transaction processing and accommodate growth in targeted areas.

4.2 Standards

The system shall support ANSI C12.22 standards for networks.

4.3 System Scalability and Redundancy

The system shall be highly scalable and support redundancy at all levels. Please describe minimum hardware requirements and disaster recovery.

4.4 Data Storage

The system shall be offered in both a premise-based data storage model, as well as a hosted solution, and the Town should be allowed to choose between the two options depending on which better meets their needs. Pricing for both options should be included.

4.5 Security

The system shall provide end to end security to include:

- Role based access for end devices, data collectors, MDM and all other related applications and the network management system. Member data must be maintained in a manner that segregates data access for individual member utilities.
- Authentication of devices and personnel
- NIST approved encryption modes and algorithms
- Security audit logging and reporting

4.6 Network Management System (NMS)

The NMS shall provide an easy to use graphical user interface (GUI) Utility Portal offering to manage and monitor the network. It shall include reports and displays to assist in viewing system and schedule performance, events and alarms, operation and maintenance.

The NMS shall provide endpoint data to other enterprise systems. It shall have references for successful integrations with established Meter Data Management (MDM) systems, if applicable. It shall also support multiple hardware and operating system platforms.

4.7 Backhaul and Communications Infrastructure

Please describe the architecture of the backhaul and communications infrastructure. Be sure to outline backhaul requirements for the Town to accommodate the solution, such as:

- Preliminary backhaul locations
- Backhaul (fiber, cellular, etc.)
- Bandwidth
- Hardware

Also please include any other uses for the communications network. Examples would be local WiFi networks for public and Town departments, street light control, smart cities applications, cameras, and other smart cities applications.

If a data collector is part of the communications infrastructure, please describe its functionality. Normally, it manages and controls meter registration and communications. The data collector may also provide distributed intelligence capabilities for Smart Grid network management including:

- Data collection
- Event filtering
- Rate programming
- Voltage monitoring
- Data transmission
- Network routing
- Data redundancy
- Security key distribution management
- Data retransmissions
- Device programming and flashing

4.8 Deployment Process

Please describe the deployment process. Some areas to include are:

- System design
- Head-end deployment
- Communications backhaul
- Communications field equipment
- Field data capture
- Meter deployment
- Remote water meter areas
- Provisioning / fine tuning the system
- System integrations
- Ongoing support

4.9 Electric meters

Functionality:

- Report KWh consumption (delivered, received, delivered + received, and delivered – received), kVARh or kVAh consumption
- Energy and demand readings for active power, reactive power, and apparent power for both delivered and received quantities
- Four-tier four season TOU energy
- Remote firmware and software upgrade capability
- Outage and voltage monitoring
- Multi-channel interval data recording (5, 15, 30, or 60 minute)
- Tamper detection
- Remote service connect and disconnect

Features of interest include:

- Auto-registration, re-registration
- Service disconnect and reconnect
- Standards based
- Programmable LCD display
- Advanced security with encryption
- Residential support for HAN
- Optional direct WAN communications
- Power quality monitoring (PQM)
- Transformer loss compensation

4.10 Water meter modules

The system shall provide two way communications to read usage, interval data, status, and report events including leak detection, low battery, cut cable and communications errors. The two way communications shall facilitate time synchronization and firmware updates.

- All water AMI meters will need to communicate with the system. This includes water meters located in areas with no electric infrastructure. Please provide details on how the system will address these areas, some of which may be 1 mile from the nearest electric customer
- Water AMI modules shall be capable of communicating with electric meters and other AMI modules and vice versa in the network
- The AMI modules must function accurately and not be damaged over an operating temperature range of -40 degree C to +70 degree C
- Water modules shall be housed in a single package designed for rugged, harsh environments and capable of complete submersion in water without damage

- The AMI modules shall be designed to operate in the above conditions and have an expected battery life of 20 years
- Battery life data shall be transmitted to the head-end system alerting of low battery levels for preemptive maintenance
- The AMI modules shall be capable of storing meter data including date and time stamps in non-volatile memory
- The AMI modules shall have the capability to receive and process commands from the head-end system for all firmware updates
- The AMI modules shall employ actionable alerts; indicate compliance with each below:
 - Tamper Alert or Meter disconnected
 - Leak Detected
 - No Flow detected
 - Reverse Flow/Backflow
 - High Flow Rate Detected
 - Battery Health

4.11 Distribution Automation (DA)

Communications: Does the AMI system support integration of industry leading DA devices to provide data inputs such as voltage, current, and demand values for the SCADA system? Does the system support a wide variety of standard IP and DA protocols? If so, please describe.

4.12 Support for Outage Management

Does the system monitor and collect service status data from meters and sensors throughout the system, immediately after they occur to confirm power outage, restoration, etc.? If so, is this accomplished through endpoint-originated notifications or by pinging network elements?

Data shall include detailed historical outage data from every endpoint to support SAIDI, SAIFI, and other reporting requirements. Outages and restorations shall be published to an enterprise message bus or sent to an OMS using a web service. The outage detection interface shall support the MultiSpeak standards (please specify which standards) and be certified interoperable by the standards body.

4.13 Support for Voltage Monitoring

The system shall retrieve scheduled reads and voltage alarms from strategic meters or sensors. Alerts shall be triggered if the voltage deviates from configurable thresholds.

4.14 Meter Data Management System (MDMS)

The MDMS should provide a comprehensive and complete solution to meet the core capabilities listed below. The MDMS will be implemented as the central platform for AMI system interface, read data collection, billing determinant processing, Validation, Editing and Estimation (VEE), AMI data analytics and exception reporting. It shall serve as the operational data store and must be capable of maintaining separate databases and secure access for individual Member cities. The MDMS is expected to have a minimum functional operational life of ten (10) years presuming deployment of recommended system maintenance releases.

The MDMS is expected to include the following core capabilities:

- Support of future tariffs that may include, but not be limited to, Time-of-Use, Critical Peak Pricing, Real-Time Pricing, Pre-pay services and other rates necessary to support Electricities' achievement of the requirements.
- Support of multi-commodity AMI endpoints (electric and water) processing interval data, register reads, endpoint alerts, endpoint events, and billing functions.
- Performance of billing determinant calculations and VEE processing of electric interval data and water readings received from the AMI system, and integrate with legacy and/or Town of Tarboro-hosted CIS applications. Define additional CIS integration benefits if offered such as to service/work order management.
- Support outage and restoration detection, notification and verification as defined in the functional requirements.
- Securely support remote commands: disconnect and reconnect, on-demand energized meter verification, on-demand read, scheduled read, as defined in the functional and minimum requirements. Describe the security methods employed.
- Support tampering and theft detection, recording and exception handling.

If a separate MDMS is not needed by the system, please explain how the system handles the core capabilities above.

4.15 Training

Training is an important part of fully realizing the potential of any Smart Grid Modernization project. Training must be included in the proposal. It shall include training for Town staff on central/hosted services and products, utility personnel and/or subcontractors responsible for the installation and maintenance of the hardware installed in the field. Training for the Town's software system administrator(s), operators and customer service representatives will be required.

4.16 Project Management

Project Management is essential to the success of the project. Bidders will be evaluated, in part, on the strength and experience of their Project Management capabilities. The successful bidder shall have multiple installed systems of like-sized utilities with good references.

4.17 Quality and Industry Experience

The Town is committed to providing quality products and services to our customers. As such, we insist on quality products and services from our vendors. Bidders will be evaluated, in part, on the quality of their products and services.

The Town is seeking a proposal which meets its requirements from a vendor experienced in similar or larger projects. The preferred vendor will have multiple projects with electric and water meters. Please provide references and/or case study examples of similar projects completed.

For the AMI project, the Town would typically prefer using utility employees to install meters, however, dependent upon cost, the Town would consider a vendor-supplied contractor for the installation of meters and AMI modules.

Appendix A

Proposal Submission Format

Section 1.0 - Executive Summary

- The scope of the Bidder's Proposed Solution, identifying the functional areas included.
- Provide information on any sub-contractors included in your proposal including meter installation, communications provider, etc.

Section 2.0 - Company Overview

- Description of corporate qualifications, including industry experience, organizational structure, and a statement regarding financial soundness.

Section 3.0 – Technical Proposal

- Refer to Sections 3 (Objectives) and 4 (Minimum Functional Requirements) of this RFP. Please describe the technical aspects of your product and/or service offering. Bidders should pay particular attention to describing clearly and concisely the functional and performance benefits of their offering.
- Proposals submitted should include a discussion of the capabilities of the proposed technology, recommendations on installation and deployment of the technology (including any services being proposed to perform installation and deployment), and a discussion of additional functionality beyond that which is requested in this RFP (i.e. GIS, OMS, customer portal, or other available capabilities), which may be achievable through the deployment of the technology.
- Components of solution proposed:
 - a. AMI System

Bidders should include a description of all AMI solutions proposed, including electric and water meter reading. Proposals should address how remote connect/disconnect and prepay features can be incorporated in the solution.

b. Field Area Network

Bidders should include a description of proposed communications infrastructures required for metering solutions. If multiple communication infrastructures are proposed, bidders should provide a comparison of the benefits of each proposed communications solution. In such cases, an explanation of why each methodology is recommended is requested.

c. Meter Data Management System (MDMS)

Bidders should include a description of proposed MDMS (if necessary) to meet the Objectives and Minimum Functional Requirements of the Town.

Section 4.0 – Price and Business Relationship Proposal

- Please provide pricing information based on full deployment of the proposed solution. Bidders may include pricing for alternate solutions, and add-on options that may be available.
- This pricing should include all costs of all Hardware, Software, Service, Software Licensing, and Service Maintenance and Licensing.

Section 5.0 – Appendices

- Include relevant material needed to aid with the understanding of the proposal content. This can include additional detail that will enhance your response as well as additional information that you believe will aid the Town's evaluation of proposals but was not specifically solicited. This may include case studies and customer references. This may also include T&Cs, warranty, and other information.