

Enabling EV and DER Adoption Through DERMS, AMI, and Fiber Integration

STATEMENT OF PROJECT OBJECTIVES

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by

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(b) (4)

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A. PROJECT OVERVIEW

The rapid growth of distributed energy resources (DERs) and electric vehicle (EV) adoption continues throughout Rappahannock Electric Cooperative's (REC) territory. The Cooperative recently launched Vividly Brighter™, a suite of energy products and services that will promote the adoption of DERs and EVs focusing on energy solutions for the future. While these solutions present an opportunity for the member and the Cooperative, how REC manages these resources will help the utility reduce peak power consumption, avoid costly system upgrades, drive resiliency and reliability, and improve the flexibility of the grid. Left unmanaged, DERs can disrupt utility operations and unbalance the grid, but integration presents a major challenge for utilities due to cost, regulatory, and operational challenges. Further, leveraging smart metering data beyond the primary business case of consumption and billing will further allow leveraging advanced metering infrastructure (AMI) to gain operational efficiencies, reliability improvements, better consumer engagement, and effective integration of distributed energy resources. To address both of those upgrades, REC is deploying an effective fiber utility network that connects various nodes and devices for fast and effective data communication that is essential. REC will deploy a distributed energy resources management system (DERMS) that will be enabled through an advanced metering upgrade from current aging technology and the completion of a fiber utility network that connects all various nodes and devices throughout REC's service territory.

B. SCOPE OF WORK

This project will deploy a distributed energy resources management system (DERMS) that will be enabled through an advanced metering upgrade from current aging technology, and a fiber utility network capable of connecting all nodes and devices throughout Rappahannock Electric Cooperative (REC) service territory. Mass adoption of electric vehicles (EVs) and distributed energy resources (DERs) hinges on the integration of these systems to help the Cooperative manage the electric grid and ensure reliability. In addressing the impacts of climate change, REC believes that DERs and EVs will contribute largely to the future of energy, thus the Cooperative wants to be prepared for a net zero energy future. The work will be broken into three areas and will all be performed roughly about the same time, with some completing earlier than others. The DERMS platform will be the earliest to complete, followed by fiber utility network and the accompanying security systems, and finally the AMI/RF Mesh with the meter changeout.

C. TASKS TO BE PERFORMED

Task 1 – Project Management, Planning and Reporting (Q1 – Q20): The management team with the Shpigler Group will lead Task 1 and exercise management for the project lifetime and coordinate efforts with other partners. REC will be responsible for financial management of all aspects related to the project and will report progress to DOE.

Subtask 1.1 – Develop Project Management Plan: REC in coordination with DOE will develop a PMP that will be updated annually, or as needed to reflect project changes. The PMP will include roles, tasks, milestones, deliverables, and a communications plan.

Subtask 1.2 – National Environmental Policy Act (NEPA) Compliance: REC will provide the documentation necessary for any NEPA compliance required.

Subtask 1.3 – Cybersecurity Plan: REC will work with all partners to ensure a cybersecurity plan is developed, addressing both IT and OT requirements and delivered to DOE.

Subtask 1.4 – Monitor Progress and Milestones: REC in coordination with the Shpigler group will actively work with all project teams, including all subcontractors, to manage task execution, monitor progress against milestones and deliverables, evaluate risks and execute mitigation strategies, if needed. REC will also coordinate with DOE on a quarterly basis to make sure project goals and objectives are executed as expected.

Subtask 1.5 – Monitor Project Budget: REC's finance group will continually monitor and manage project costs against the approved budget, prepare invoices and any other financial records per DOE guidance and processes. REC will also ensure that the project cost share is expended proportionally per invoice.

Subtask 1.6 – DOE Reporting: REC project management team will prepare and submit quarterly progress reports and required financial reports. The team will also produce a final project report to be submitted to DOE at the end of the fifth year of the project.

Task 2 – Design and Engineering (Q2 – Q3): REC will work with OATI and Landis+Gyr to design and engineer the DERMS and AMI systems to be installed. This will include integration planning with REC's fiber optic network and NISC's iVue enterprise management platform. AMI radio frequency collection point locations will be determined using Landis+Gyr's study and integration with fiber.

Subtask 2.1 – Develop System and Operational Requirements: REC will work with OATI, L&G, and [REDACTED] to identify and develop all the system and operational requirements for the integrated project.

Subtask 2.2 – Complete Propagation Study for AMI/RF Mesh: REC will work with L&G to complete a propagation study ensuring locations of all RF receivers are determined.

Subtask 2.3 – Identify DER Locations for DERMS Integration: REC will identify locations of DERs to integrate them as a pilot into the DERMS platform.

Subtask 2.4 – Develop Meter Change Out and Decommissioning Plans: REC, with L&G, will develop plans for the meter change out, as well as, how we decommission the existing meters.

Task 3 – Construction and Deployment (Q3 – Q20): REC will work with all the partners and local contractors to construct and deploy all components of this project.

Subtask 3.1 – Installation Planning: REC will execute all contracts with stakeholders involved in the construction and deployment stage, ensuring they meet all policies and standards, including safety. REC will also procure all the required equipment.

Subtask 3.2 – Fiber Installation: REC will continue to work with [REDACTED] to finish the remaining 300 miles of fiber installation. (b) (4)

Subtask 3.3 – AMI/RF Mesh Installation: REC will work with L&G to install the AMI/RF Mesh network territory wide.

Subtask 3.4 – Meter Changeout: REC will use local contractors to begin the meter changeout.

Subtask 3.5 – DERMS Deployment: REC will work with OATI to deploy the DERMS platform. With the identified DER locations, the platform will test the management of those devices and integration with the SCADA system.

Subtask 3.6 – System Integration and Testing: For each of the Task 3 items, REC will work with each partner to ensure all systems are integrated with NISC, the enterprise system, and perform testing.

Task 4 – Inspection and Verification (Q8 – Q20): REC will lead the inspection and verification at each phase of completion to ensure systems were installed correctly and working as expected.

Subtask 4.1 – Utility Inspection: REC will inspect all installed systems to verify proper labeling, proper disconnects, and access to equipment. All installations will be verified to confirm they meet the latest version of the National Electrical Safety Codes and meet current UL certification. This task is also responsible for making sure the proper utility meter is installed.

Subtask 4.2 – Perform DERMS/AMI Deployment Readiness and Functionality: REC with all partners will conduct a deployment readiness and functionality test to ensure system turnover is successful.

Subtask 4.3 – Cybersecurity Plan Test: REC will conduct a tabletop exercise to ensure that the plan works as intended.

Subtask 4.4 – User Training: REC will work with all partners to ensure each user is trained on each of the installed systems.

Subtask 4.5 – Final System Turnover: Once all inspections and verifications have been conducted, REC will verify to see if there are any other immediate changes needed. At this point, documentation will be provided for the full system prior to the system turnover.

Task 5: - Data Collection, Monitoring, and Analysis (Q8 – Q20): This task will be managed by the data team and is responsible for monitoring the performance of the system. The Data team will coordinate with all other teams to make any necessary adjustments to optimize performance.

Subtask 5.1 – Data Collection and Analysis: The Data team will initially model the ideal system performance based on theoretical models. The team will collect data throughout the project and analyze and provide reports.

Subtask 5.2 – System Optimization: On a quarterly basis, the data team will provide a complete review of the data analyzed and provide recommendations on any adjustments that may be needed to improve the functionality of the system.

Task 6: Outreach and Training (Q1 – Q20): This task will be managed by the outreach team and is responsible for developing training, marketing, and communication materials. The materials will be presented online and in-person at selected conferences. Metrics will be established for evaluating the effectiveness of the outreach.

Subtask 6.1 – Define Audience & Content: The team will first define the target audience which will include co-op directors, management, technical staff, member-services staff, utility industry peers, and vendors. The team will develop the material needed to address the audience mentioned.

Subtask 6.2 – Analyze & Select Outreach Channels: The team has access to several different channels which are used for outreach, including magazines, conferences, topic-specific webinars, and other reports. The team will also publish peer reviewed papers on the outcomes of the project. The outreach task will also include quarterly newsletters that highlight functionality of the system and challenges faced.

Subtask 6.3 – Schedule: The schedule for outreach and training will be developed concurrently with the audience/content development subtask and will be designed to reach the widest range of interested parties.

Subtask 6.4 – Execute Outreach: Outreach will continue over the entire 5 years.

D. DELIVERABLES

Task 1 Deliverables

Subtask 1.1 – D1.1: Project Management Plan

Subtask 1.2 – D1.2: NEPA Compliance

Subtask 1.3 – D1.3: Cybersecurity Plan

Subtask 1.6 – D1.4: Quarterly Reports

Subtask 1.6 – D1.5: Annual Reports

Subtask 1.6 – D1.6: Final Project Report

Task 2 Deliverables

Subtask 2.2 – D2.1: Propagation Study

Subtask 2.4 – D2.2: Meter Change Out and Decommissioning Plan

Task 3 Deliverables

Subtask 3.4 – D3.1: Installation Completion Report per Phase

Task 4 Deliverables

Subtask 4.5 – D4.1: System Turnover Report

Task 5 Deliverables

Subtask 5.1 – D5.1: Quarterly Data Report

Subtask 5.2 – D5.2: Annual System Report

Task 6 Deliverables

Subtask 6.3 – D6.1: Outreach and Training Plan

E. BRIEFINGS/TECHNICAL PRESENTATIONS

REC is prepared to meet all DOE requirements on briefings and technical presentations.