Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1234-TechnicalVolume.pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project/Performance Site Location(s)

Project/Performance Site Primary Location

☐ I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name: The Narragansett Electric Company

UEI: SGGXNGJ613C3

* Street1: 280 Melrose Street

Street2:

* City: Providence County:

* State: RI: Rhode Island

Province:

* Country: USA: UNITED STATES

* ZIP / Postal Code: 029072157 * Project/ Performance Site Congressional District: RI-001

Project/Performance Site Location 1

☐ I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name:

UEI:

* Street1:

Street2:

* City: County:

* State:

Province:

* Country: USA: UNITED STATES

* ZIP / Postal Code: * Project/ Performance Site Congressional District:

Additional Location(s) Add Attachment Delete Attachment View Attachment

PPL Services Corporation

Two North Ninth Street
Allentown, PA 18101-1179

SENT VIA EMAIL ONLY (bgrzesiuk@rienergy.com)

March 31, 2023

The Narragansett Electric Company d/b/a
Rhode Island Energy
Attn: Brian Grzesiuk, Senior Manager-Finance Business Partner
280 Melrose Street
Providence, RI 02907

RE: LETTER OF COMMITMENT AS TEAM MEMBER TO PRIME APPLICANT THE NARRAGANSETT ELECTRIC COMPANY D/B/A RHODE ISLAND ENERGY (RIE), SMART GRID FOR SMART DECARBONIZATION: DEPLOYING ADVANCED IT/OT TO MEET NATION-LEADING CLEAN ENERGY MANDATE (THE "PROJECT") TO FOA NUMBER: DE-FOA-0002740, BIL-GRID RESILIENCE AND INNOVATION PARTNERSHIPS (GRIP), TOPIC AREA 2: SMART GRID GRANTS (40107)

Dear Mr. Grzesiuk:

A Letter of Commitment is not needed from Team Member PPL Services Corporation ("PPL Services") to Prime Applicant RIE with respect to the Project to FOA Number: DE-FOA-0002740, BIL-Grid Resilience and Innovation Partnerships (GRIP), Topic Area 2: Smart Grid Grants (40107) (the "Funding Opportunity") because PPL Services is neither a subrecipient nor a "third-party cost share provider". PPL Services is the service company to its affiliate, RIE, a regulated Rhode Island utility and in this capacity, we comply with all applicable requirements of the State of Rhode Island Public Utilities Commission and Division of Public Utilities and Carriers.

Notwithstanding, this letter confirms the commitment of PPL Services to support Prime Applicant RIE as part of the Project Team with respect to the Funding Opportunity.

Sincerely,

Salvatore DiSimone
Salvatore DiSimone (Mar 31, 2023 15:53 EDT)

Salvatore J. DiSimone
Manager Finance and Performance Management
PPL Services Corporation

STATE OF RHODE ISLAND
OFFICE OF
ENERGY RESOURCES

One Capitol Hill, 4th Floor
Providence, RI 02908
www.energy.ri.gov

March 14, 2023

David J. Bonenberger
President, Rhode Island Energy
280 Melrose Street, Providence, RI 02907

Dear Mr. Bonenberger,

I am writing on behalf of the Rhode Island Office of Energy Resources (RI OER) to describe our commitment to stakeholder and community engagement as proposed by Rhode Island Energy (RIE) in their "Smart Grid for Smart Decarbonization" application (Grid Resilience and Innovative Partnerships Funding Opportunity Announcement (DE-FOA-0002740) Topic Area 2: Smart Grid Grants). RI OER is committed to engaging in both the Power Sector Transformation Advisory Group and the DER Monitor/Manage Stakeholder Working Group.

RI OER's mission is to lead the state toward a clean, affordable, reliable, and equitable energy future. Our office has led or partners with stakeholders, including RIE, on various efforts related to grid modernization, the Interconnection Technical Standards Committee, solar policy and updates to various tariffs.

During 2018-2022, RI OER participated in the Power Sector Transformation Advisory Group. Additionally, OER hired a consultant to assist with our office's participation in grid modernization dockets, including RIE's Advanced Meter Functionality proposal to the RI Public Utilities Commission. RI OER is interested in continuing its engagement with the Power Sector Transformation Advisory Group to stay abreast of implementation progress and challenges, and provide insights on the work proposed in RIE's grant application. We look forward to engaging with RIE and other stakeholders particularly related to energy justice and engagement with important constituencies.

RI OER is also keenly interested in engaging with the DER Monitor/Manage Stakeholder Working Group to develop practical amendments to RIE's interconnection tariff alongside developers and other key community stakeholders. In 2018-2019, RI OER collaborated with RIE to engage approximately fifteen renewable energy developers on a prior amendment to RIE's interconnection tariff. Through meaningful engagement, we were able to reach consensus on several revisions. RI OER fully supports RIE's proposal to convene another stakeholder working group to help develop this next tariff amendment and looks forward to participating.

Sincerely,
State of Rhode Island Office of Energy Resources

Chris Kearns

Chris Kearns
Acting Energy Commissioner

CENTER FOR JUSTICE

One Empire Plaza, Providence RI 02903 | 401-491-1101 | CenterForJustice.org

David J. Bonenberger
President, Rhode Island Energy
280 Melrose Street, Providence, RI 02907

March 14, 2023

Dear Mr. Bonenberger,

I am writing on behalf of the Rhode Island Center for Justice to describe our prior engagement in the Power Sector Transformation Advisory Group, and our interest in continuing engagement. The Center for Justice understands that Rhode Island Energy is requesting federal funding through the Grid Resilience and Innovative Partnerships Funding Opportunity Announcement (DE-FOA-0002740) Topic Area 2: Smart Grid Grants. As part of their application "Smart Grid for Smart Decarbonization", Rhode Island Energy is proposing continued stakeholder engagement via the Power Sector Transformation Advisory Group.

The Rhode Island Center for Justice is a non-profit law center that works in partnership with grassroots community organizations to advance economic justice and resilience for low-income Rhode Islanders. We have worked for over five years representing low-income utility consumers in a variety of regulatory proceedings addressing the intersection between utility policy and Rhode Island's statutory commitments to decarbonization. Low-income consumers have a heightened interest in grid modernization due to two key factors (1) their crucial need for sustainable, affordable access to utility service at the lowest rates possible due to their constrained income; and (2) the impact of environmental degradation and climate change have historically had a disproportionately severe impact on low-income communities and particularly low-income communities of color. The mitigation of these impacts through grid modernization and other strategies is therefore of high concern to our clients and the community that we serve.

On behalf of low-income utility consumers, the Center has participated in the many critically important sessions of the Power Sector Transformation Advisory Group during 2018-2022. The potential benefits of the smart grid are magnified for consumers who are least able to sustain the costs of utility service. For all of these reasons, the Rhode Island Center for Justice is interested in continuing its engagement with the Power Sector Transformation Advisory Group to stay abreast of implementation progress and challenges, and provide insights with specific relevance to low-income consumers related to the work proposed in RIE's grant application.

Sincerely,

Jennifer L. Wood
Executive Director

GREEN ENERGY CONSUMERS ALLIANCE

David J. Bonenberger
President, Rhode Island Energy
280 Melrose Street, Providence, RI 02907

March 12, 2023

Dear Mr. Bonenberger,

I am writing on behalf of Green Energy Consumers Alliance to describe our prior engagement in the Power Sector Transformation Advisory Group, and our interest in continuing engagement. Green Energy Consumers understands that Rhode Island Energy is requesting federal funding through the Grid Resilience and Innovative Partnerships Funding Opportunity Announcement (DE-FOA-0002740) Topic Area 2: Smart Grid Grants. As part of their application "Smart Grid for Smart Decarbonization", Rhode Island Energy is proposing continued stakeholder engagement via the Power Sector Transformation Advisory Group.

We are a nonprofit organization based in Providence and Boston with a mission to speed the transition a net zero economy. We see grid modernization as one of the essential pieces to the puzzle.

During 2018-2022, Green Energy Consumers participated in the Power Sector Transformation Advisory Group. We participated in every meeting and supported the roll out of advanced meters, time-varying rates, demand response, and other related investments necessary to support the beneficial electrification of transportation and heating.

Green Energy Consumers is interested in continuing its engagement with the Power Sector Transformation Advisory Group to stay abreast of implementation progress and challenges, and provide insights related to the work proposed in RIE's grant application. We would like to see a thorough benefit-cost analysis, a robust consumer education and public engagement process, and regular reports on the meeting of key implementation milestones. Grid modernization is going to require major investments that will last for many years and it is important to use to get it right in 2023 and 2024.

Sincerely,

Larry Chretien, Executive Director

STATEMENT OF PROJECT OBJECTIVES (SOPO)

Smart Grid for Smart Decarbonization:
Deploying advanced IT/OT to meet nation-leading clean energy mandates

A. OBJECTIVES

The goal of the proposed smart grid investments is to enable smart decarbonization, such that the State of Rhode Island can meet its climate and clean energy mandates safely, reliably, and affordably. In doing so, the Project Team will demonstrate to the nation a viable path to aggressive decarbonization at scale. In developing this proposal and workplan, the Project Team has the following project objectives:

1. Leverage the Project Team's collectively expertise and strong stakeholder relationships to develop a practical, efficient, and just-in-time deployment plan that results in successful project deployment and meaningful community engagement.
2. Invest in "no-regrets" foundational solutions first as determined by extensive data-driven electrical analysis and decarbonization scenario modeling.
3. Defer to stakeholders with first-hand understanding of lived experience to make sure plans for deployment, cost recovery, and ongoing operations work for all customers, with special focus on underrepresented customers in disadvantaged communities (DACs).

In letting these objectives guide the Workplan, and in advancing these objectives, the Project Team will successfully deploy a portfolio of smart operational technology (OT) and informational technology (IT) that will enable safe, reliable, and affordable decarbonization at scale. This SOPO includes only one phase of work (deployment) but is broken up into five annual budget periods separated by clear go/no-go decision points (see the Workplan section of the Technical Volume for more information).

B. SCOPE OF WORK

The Project Team's approach to achieve the proposed overall project objectives is through deliberate deployment of each IT and OT component (represented by Tasks 2-5), thoughtful integration of all IT and OT components (Task 6), meaningful community and stakeholder engagement throughout the period of performance (Task 7), and ongoing robust communication both within the Project Team and with DOE (Task 8).

Each of the IT deployment tasks (Tasks 2-4) is staged such that each subtask builds on the previous subtask, representing a sequential workflow that is both logical and practical for deployment of these IT components. Each IT deployment task culminates in a subtask to develop a case study on that IT component; these case studies will be incorporated into the final report at the end of the period of performance.

The OT deployment task (Task 5) is organized by subtasks representing deployment of individual components to be completed in parallel. The rate of deployment of these OT components is roughly constant throughout the deployment period; the exact rate of deployment for each of the five annual budget periods can be specified and adjusted during the go/no-go decision prior to the budget period to match annual regulatory pre-approval.

By calling out engagement in Task 7, the Project Team intends to provide the salience its engagement plans deserve. In practice, the engagement proposed in Task 7 will be fully integrated with the IT and OT deployment tasks (Tasks 2-5), the integration task (Task 6), and the project management task (Task 8).

C. TASKS TO BE PERFORMED

Task 1: Project Management and Planning

Subtask 1.1 – Project Management Plan (PMP)

Within 30 days of award, the Recipient shall submit a Project Management Plan (PMP) to the designated Federal Project Officer (FPO). The Recipient shall not proceed beyond Task 1.0 until the PMP has been accepted by the FPO. The PMP will include an explicit workplan for filing a proposal with the RI PUC on reduction of cost recovery due to availability of federal funding. The PMP shall be revised and resubmitted as often as necessary, during the course of the project, to capture any major/significant changes to the planned approach, budget, key personnel, major resources, etc. The Recipient shall manage and direct the project in accordance with the accepted PMP to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented, and that project reporting and briefing requirements are satisfied.

Subtask 1.2: National Environmental Policy Act (NEPA) Compliance

As required, the Recipient shall provide the documentation necessary for NEPA compliance.

Subtask 1.3: Cybersecurity Plan (CSP)

The CSP shall be revised and resubmitted as often as necessary, during the course of the project, to capture any major/significant changes.

Subtask 1.4: Continuation Briefings

The Recipient will brief DOE on roughly an annual basis to explain the plans, progress and results of the technical effort. The briefing shall also describe performance relative to project success criteria, milestones, and the Go/No-Go Decision point that are documented in the Project Management Plan (PMP).

Task 2: Install ADMS and prepare for DER M/M

Subtask 2.1 - ADMS DMS, OMS, FLISR, VVO, DERMS, CVO

Build, install, test, and deploy the Digital Twin for the electric distribution system; Build, install, test, and deploy an ADMS platform consisting of traditional DMS and OMS functionality and with advanced features to include FLISR, VVO, CVR, DERMS

Subtask 2.2 - AEMS

Build, install, test, and deploy the Digital Twin for the electric transmission system; Build, install, test, and deploy an AEMS platform that operationalizes DLR

Subtask 2.3 - Interconnection Tariff Amendments

Revise RIE's interconnection tariff to be compatible with DER M/M; coordinate internally with Johnson, Grant, Schuster, Russell Salk, Castro, Constable

Subtask 2.4 - Produce deliverables

Entails writing, incorporating feedback from stakeholders and SMEs

Task 3: Build and launch Digital Twin

Subtask 3.1 - Initialization

Initialization includes data includes data assessment, source data mapping, and initial

data pilot; develop infrastructure architecture & prototyping

Subtask 3.2 - Finalization

Finalization includes Mock 1 & Mock 2 data migrations; infrastructure development, and system configuration design and build; AUD configuration and modeling with system integration, system acceptance, and user acceptance testing phases

Subtask 3.3 - Produce deliverables

Case study on Digital Twin; includes at least three interviews with operators to understand what works well, what challenges remain, and lessons learned; Deliverable: Case Study on Digital Twin

Task 4: Build and launch Asset Hub

Subtask 4.1 - Data collection

Map asset health, life-cycle, and data source; build master data and life cycle status

Subtask 4.2 - Rules engine

Develop, test, and refine business rules for use in Asset Hub to automate processing of data

Subtask 4.3 - Produce deliverables

Entails writing, vetting of case study; incorporating insights; at least three interviews with operators who work with Asset Hub on what works well, what the challenges are, and lessons learned; Deliverable: Case Study on Asset Hub

Task 5: Smart Field Devices and Communications

Subtask 5.1 - Advanced reclosers

Deploy and validate 1,339 advanced reclosers in the field

Subtask 5.2 - Smart digital relays

Deploy and validate 171 smart digital relays in the field

Subtask 5.3 - Smart capacitors and regulators

Deploy and validate 742 smart capacitors and regulators in the field

Subtask 5.4 - Fiberoptic communications backbone

Deploy and test 100 miles of fiberoptic cable; locations of deployment strategized to match locations of smart field devices such that benefits from those devices can begin to accrue

Task 6: Integration and Cybersecurity

Subtask 6.1: Ongoing integration of OT and IT

Continued verification that OT and IT are working together seamlessly and accurately

Subtask 6.2: Cybersecurity protocols and verification

Ongoing work to assure cybersecurity best practices are in place

Task 7: Engagement

Subtask 7.1 - Power Sector Transformation Advisory Group (PSTAG)

Convene PSTAG on a quarterly basis through both virtual and in-person meetings; agendas will each include report out on progress, planned work, lessons learned, and insights, with time for stakeholder discussion, feedback, and questions; liaise with leads for Tasks 1-6; Milestones: quarterly meetings

Subtask 7.2 - DER M/M Stakeholder Working Group

Identify members, develop agendas, coordinate at least 6 meetings, compile feedback, develop meeting materials, liaise with Castro and Conrad to translate stakeholder insights into interconnection tariff amendments; Milestones: stakeholders identified, 6 meetings held, tariff amendments developed

Subtask 7.3 - Annual All-Hands Project Team Meeting

Convene annual meetings for all members of the Project Team, including personnel who install smart field devices; coordinate meeting logistics; develop agendas and meeting materials; liaise with Castro to share insights for continuous improvement; liaise with Evans to share insights related to DEIA

Task 8: Project Management

Subtask 8.1 - Internal project management

Biweekly internal meetings with the Project Team to assess progress, identify and resolve issues, share insights, and make progress; quarterly internal meetings to report out and receive guidance from RIE and PPL leadership

Subtask 8.2 - Coordination with DOE

Meetings with DOE grant manager, staff, and other DOE-sponsored events to share insights and progress; providing briefings; adjustments to the workplan due to annual approval cycle of Electric ISR Plan at each go/no-go decision point

Subtask 8.3 - Reporting and invoicing

Quarterly financial and performance reporting; other reporting as required

Subtask 8.4 - Final report

Develop the final report to include all case studies, additional insights, recommendations for future research and funding, best practices and lessons learned from community engagement, and steps for replicability

D. DELIVERABLES

Subtask 1.1: Project Management Plan

Subtask 1.3 – Cybersecurity Plan (*if applicable)

Subtask 1.4 – Pre-Continuation Briefing Document(s)

Subtask 2.3 – Interconnection Tariff Amendments

Subtask 2.4 – Case Study on DER M/M

Subtask 3.3 – Case Study on Digital Twin

Subtask 4.3 - Case Study on Asset Hub

Subtask 7.1 – Meeting Materials

Subtask 7.2 – Membership List, Meeting Materials and Minutes

Subtask 7.3 – Meeting Materials and Minutes

Subtask 8.4 – Final Report

In addition to the deliverables listed above, the Recipient shall submit all periodic, topical, final, and other reports in accordance with the Federal Assistance Reporting Checklist and accompanying instructions.

E. BRIEFINGS/TECHNICAL PRESENTATIONS

The Recipient shall prepare, and present periodic briefings, technical presentations and demonstrations as requested by the Federal Project Officer, which may be held at a DOE or the Recipient's facility, other mutually agreeable location, or via webinar. Such meetings may include all or a combination of the following:

Kickoff Briefing - Not more than 30 days after submission of the Project Management Plan, the Recipient shall prepare and present a project summary briefing as part of a Project Kickoff Meeting.

Pre-Continuation Briefing - Not less than 90 days prior to the planned start of a budget period, the Recipient shall brief the DOE on the results to date, and their plans for the subsequent periods of work. The DOE will consider the information from this briefing, as well as the content of deliverables submitted to date, prior to authorizing continuing the project.

Final Project Briefing - Not less than 30 days prior to the end of the project, the Recipient shall prepare and present a Final Project Briefing on the results and accomplishments of the entire project.

Other Briefings – The Recipient shall prepare and present technical, financial, and/or administrative briefings as requested by the DOE. Additionally, the DOE may require Recipients to make technical presentations at national and/or industry conferences.

Smart Grid for Smart Decarbonization:
Deploying advanced IT/OT to meet nation-leading clean energy mandates

The Narragansett Electric Company d/b/a Rhode Island Energy, Kathy Castro (PI)
PPL Services Corporation

Clean distributed energy resources and strategic electrification are necessary to mitigate climate change, but such investments are already creating new operational complexities for utilities across the country. With existing electric infrastructure, operators need adequate tools and technology to manage the grid and shifting dynamics of energy flows across it. Indeed, many grid operations are still conducted manually and supported by hand calculations. These methods will no longer be viable as increasing levels of Distributed Energy Resources (DER) like solar and wind energy, electric heating, and electric vehicle charging require more frequent and flexible grid adjustments.

In this proposal, prime applicant Rhode Island Energy (RIE) and team member PPL Services Corporation (PPL) (together referred to as "the Project Team"), propose a comprehensive suite of information technology (IT) and operational technology (OT) to catalyze the most advanced electric power system (EPS) in the nation, in the state with one of the most aggressive climate and clean energy mandates in the nation. RI is an advantageous location for this work because of its nation-leading clean energy and climate mandates, its rich history of stakeholder engagement in grid modernization planning, and the commitment and experience of RIE. These factors put RI at the forefront of need, readiness, and capability for demonstrating a technology pathway to meet global climate challenges safely, reliably, and affordably.

The Project Team proposes an integrated suite of IT and OT smart grid investments that are fully integrated with RIE's Grid Modernization Plan (GMP) to provide the requisite capability, visibility, and control grid operators need to manage complex two-way power flows. While each of these smart IT and OT systems independently offer value, their integration leads to synergies. The highly granular data coming from proposed investments in advanced reclosers, smart digital relays, and smart capacitors and regulators via the fiberoptic communications backbone is ingested and analyzed by Advanced Distribution System Management (ADMS) and Advanced Energy Management (AEMS; on the transmission system) software, which returns optimized directives to the OT devices. The centralized Asset Hub data system and an updated and integrated Geographic Information System (GIS) that represents a Digital Twin of the EPS provide supporting business and planning optimization complementary to the ADMS and AEMS. The result is smarter use of our existing electric grid as we interconnect DER and expect more from a 21st century EPS.

With these investments in place, the Project Team will have transformed its first-generation, analog electric grid to the automated, digital platform needed to interconnect decarbonized DER and serve electric end uses, transportation, and heating. This project – along with concurrent investments in RIE's electric grid – is anticipated to improve service reliability by up to 30% and enable higher penetration of distributed energy resources and strategic electrification. 100% of federal funding will go toward reducing customer costs of these investments. Most importantly, this project will demonstrate how a smart grid can enable smart decarbonization at scale safely, reliably, and affordably. To maximize impact through replicability, the Project Team will develop a case study on its insights and lessons learned.

Smart Grid for Smart Decarbonization

Rhode Island Energy™
a PPL company

Project Team:

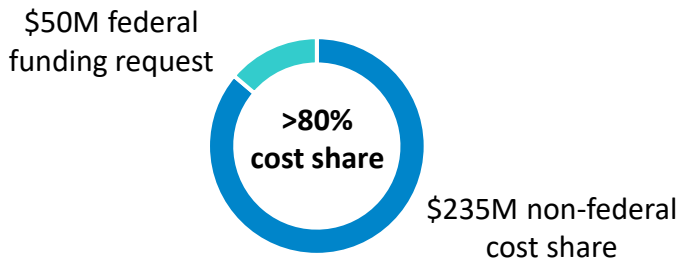
The Narragansett Electric Company d/b/a Rhode Island Energy (RIE)
PPL Services Corporation (PPL)

Problem Statement:

Clean, distributed energy resources and strategic electrification are necessary to mitigate climate change, but such investments are already creating new operational complexities for utilities across the country. With existing electric infrastructure, operators need adequate tools and technology to manage the grid and shifting dynamics of energy flows across it. Indeed, many grid operations are still conducted manually and supported by hand calculations. These methods will no longer be viable as increasing levels of Distributed Energy Resources (DER) require more frequent and flexible grid adjustments.

Project Goal: In this proposal, prime applicant and the grant recipient Rhode Island Energy (RIE) and team member and RIE affiliate and services company PPL Services Corporation (PPL) (together referred to as "the Project Team"), propose a comprehensive suite of information technology (IT) and operational technology (OT) to catalyze the unified *Smart Grid for Smart Decarbonization* concept to achieve the most advanced electric power system (EPS) in the nation, in the state with one of the most aggressive climate and clean energy mandates in the nation.

Exceeding Cost Share:



Outcomes:

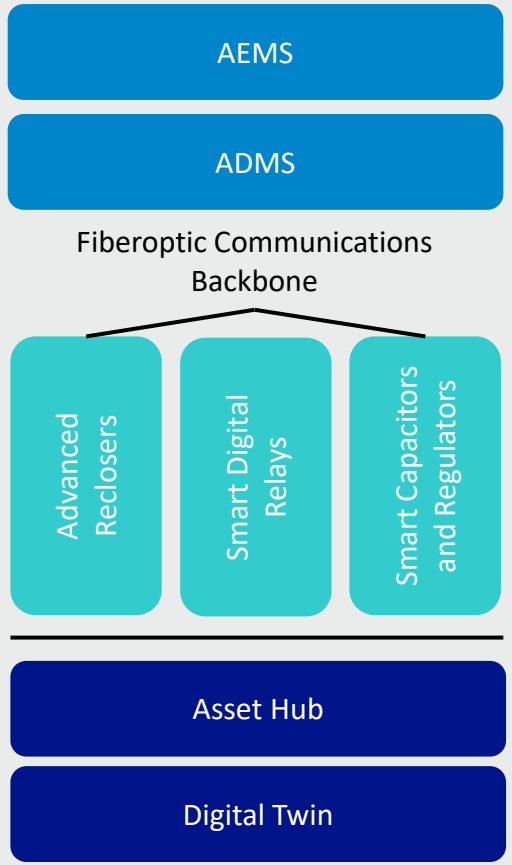
Anticipated 30% improvement in reliability

An anticipated increase in available load and hosting capacities for strategic electrification and distributed renewable generation

$50,000,000 reduction in costs otherwise recovered from customers

Technology Description:

While each of these smart IT and OT systems independently offer value, their integration leads to synergies. The highly granular data coming from proposed investments in advanced reclosers, smart digital relays, and smart capacitors and regulators via the fiberoptic communications backbone is ingested and analyzed by Advanced Distribution System Management (ADMS) and Advanced Energy Management (AEMS; on the transmission system) software, which returns optimized directives to the OT devices. The centralized Asset Hub data system and an updated and integrated Geographic Information System (GIS) that represents a Digital Twin of the grid provide supporting business and planning optimization complementary to the ADMS and AEMS. The result is smarter use of RIE's existing electric grid as Rhode Islanders interconnect DER, electrify transportation and heating, and expect more from a 21st century EPS.



Smart Grid for Smart Decarbonization

	Investment	Brief Description
IT	**Advanced Distribution + Energy Management Systems (ADMS and AEMS)**	ADMS is an enterprise software platform used by RIE to command and control the electric distribution system, including outage management and system operations. AEMS is the equivalent software platform used by PPL to command and control the electric transmission system, including outage restoration and system operations, including dynamic line ratings (DLR), smart alarms, and automated restoration.
	Digital Twin	Digital Twin is an upgraded GIS mapping software with a new Utility Network ESRI tool and Automated Utility Design (AUD) tool to supplement geographic mapping of physical assets with smart modeling of interactions (e.g., electrical, mechanical, communication) of each component on the EPS.
	Asset Hub	Asset Hub will centralize and maintain data related to infrastructure assets and analyze data (using artificial intelligence and machine learning) and recommend action to planners and operators.
OT	**Advanced Reclosers**	Advanced Reclosers are breaker equipped with a mechanism programmed to automatically close after it has been opened due to a fault, effectively sectionalizing the EPS so fewer customers are affected by any single outage.
	Smart Digital Relays	Smart Digital Relays are communication-ready relays that can adapt to power flow changes and other changes in system conditions with flexible settings, custom logic, and multiple settings groups, aimed to reduce outages and improves restoration time.
	Smart Capacitors and Regulators	Smart Capacitors and Regulators adjust system voltages up and down in a dynamic manner to accommodate the variable output of DER technologies and increase grid flexibility.
	Fiberoptic Communications Backbone	The Fiberoptic Communications Backbone will support communications to and from substations to significantly improve data flow, reliability and resiliency of communications.

Rhode Island Energy™
a PPL company

Replicability at Scale:

During the 60-month period of performance, the Project Team will deploy an integrated suite of IT and OT investments. Together, these investments will provide the capabilities, visibility, and control grid operators need to deliver safe, reliable, affordable, decarbonized power to customers. This proposal will reduce perceived risk for project deployment, lead to further deployment at scale, and lead to additional private sector investments. Perceived risk will be reduced through case studies, industry communication, and real demonstration of technical feasibility, success, and impacts. Reduced risk is likely to lead to deployment of smart grid technologies in other states and utility territories preparing their EPSs for smart decarbonization. Altogether, these investments are likely to lead to additional private sector investment from clean energy and smart grid industries.

Workplan:

The Project Team has developed its workplan, using the above objectives, to successfully achieve key outcome-based and SMART milestones with the flexibility needed to stay on budget and on schedule. Resulting tasks and sub-tasks are described below in relation to milestones and deliverables and disaggregated by budget period

Team Qualifications:

Rhode Island Energy™
a PPL company

- History of meaningful, robust stakeholder engagement regarding smart grid
- Data-driven grid modernization blueprint
- Serves 97% of Rhode Island customers
- 500MW interconnected DG; 600MW in queue; first operational offshore wind (OSW), 400MW OSW in contract, 1000 MW OSW in solicitation (aggregate will account for 70% consumption in 2030, accounting for electrification

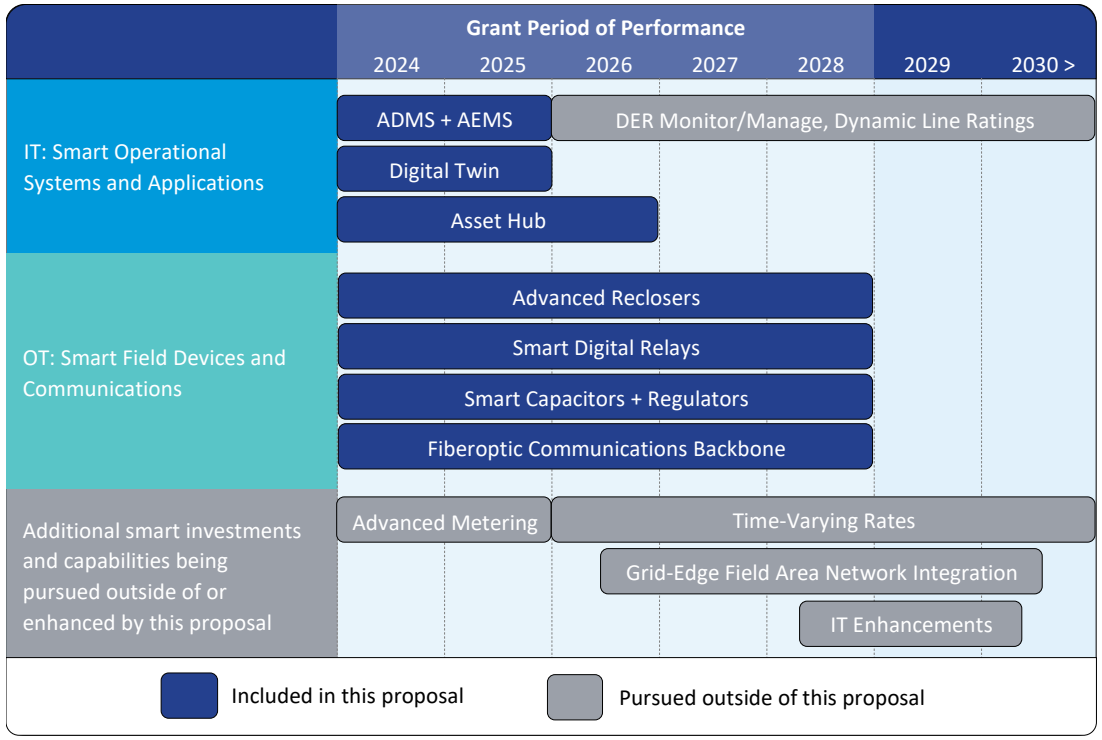
ppl

- Industry-leading experience and capabilities
- Innovative edge of grid modernization technologies
- PPL's affiliate utility companies serve more than 3.2 million customers
- Widely regarded as leaders in customer satisfaction and innovative grid solutions
- PPL's affiliate in Pennsylvania (PPL Electric) deployed a DERMS; will leverage insights for this proposal

Smart Grid for Smart Decarbonization

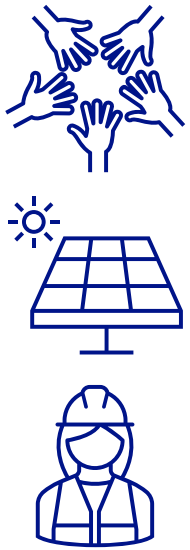
Rhode Island Energy™
a PPL company

Rhode Island is an advantageous project location:
RI is an advantageous location for this work because of its nation-leading clean energy and climate mandates, its rich history of stakeholder engagement in grid modernization planning, and the commitment and experience of its primary utility. These factors put Rhode Island at the forefront of need, readiness, and capability for demonstrating a technology pathway to meet global climate challenges safely, reliably, and affordably.



Fully Aligned with State Policy:
- 100% Renewable Electricity by 2033; Grid Modernization Plan (filed 12/2022)
- Legacy of power sector stakeholder engagement since 2014
- 2021 Act on Climate: net-zero greenhouse gas emissions by 2050, recently updated climate plan prioritizing smart grid investment for DER and electrification

Three-pronged engagement strategy:
1. Stakeholder Engagement: The Project Team will report out to and receive feedback from its Power Sector Transformation Advisory Group on a quarterly basis.
2. Community Engagement: The Project Team will convene a DER M/M Stakeholder Group to inform interconnection tariff amendments, the design of the DER M/M program, and to support process and impact evaluation of DER M/M. These insights will also be captured in the Case Study on DER M/M so that lessons learned can be replicated.
3. Labor Engagement: The Project Team will hold an annual meeting with field personnel charged with installation of smart devices and fiberoptic cable. The intent of this annual meeting is to understand how installation and related processes might be adjusted to improve safety, efficiency, and productivity. These lessons learned will inform continuous improvement and will be captured in the Final Report on Smart Grid for Smart Decarbonization.



Community benefits:
- ✓ Decrease in energy burden: 100% of federal funding will go to reduce customer costs
- ✓ Decrease in environmental exposure and burdens: Proposal enables renewable energy generation and strategic electrification
- ✓ Increase in access to low-cost capital: Existing access to 0% interest financing for qualifying energy efficiency and demand response technologies
- ✓ High-quality job creation, the clean energy job pipeline, and job training for individuals: Project Team commitment and associated actions
- ✓ Clean energy enterprise creation and contracting: Project Team commitment to promoting supplier diversity, including through preferential and strategic recruiting.
- ✓ Energy democracy, including community ownership: Existing renewable programs
- ✓ Parity in clean energy technology access and adoption: Proposal enables more renewable distributed energy resources interconnection at lower costs
- ✓ Increase in energy resilience: Anticipated 30% improvement in reliability

Executive Summary

Driven by state policy, stakeholder engagement, and climate justice

The Project Team[1] shares DOE's commitment to and has taken actions towards DOE's goals of (1) supporting meaningful community and labor engagement; (2) investing in the American workforce; (3) advancing diversity, equity, inclusion, and accessibility (DEIA); and (4) ensuring that 40% of the overall benefits of certain federal investments flow to disadvantaged communities (DACs), in alignment with the Justice40 Initiative. Indeed, 100% of federal funding will directly reduce customer cost recovery.

This proposal[2] directly advances state climate and clean energy mandates. Rhode Island's *2022 Update* to the *2016 Greenhouse Gas Emissions Reduction Plan* not only assesses progress to date, but also identifies priority actions needed by 2025 to get on the path to reaching RI's climate mandates, as informed by nearly two dozen community listening sessions[3] and based on years of technical, economic, and policy analysis via state-led reports and stakeholder engagement. This proposal directly advances these state policy directives and leverages and extends years of robust stakeholder engagement through the grant period:

Legacy of stakeholder engagement:

2014-2016 – The *Systems Integration Rhode Island* stakeholder working group.[4]

2017 – *Power Sector Transformation* stakeholder sessions.[5]

2018-2022 – The *Power Sector Transformation Advisory Group* (PSTAG).[6] RIE filed its stakeholder-refined Grid Modernization Plan (GMP) with the Rhode Island Public Utility Commission (RI PUC) in December 2022,[7] and this proposal is in direct alignment with the GMP's blueprint for strategic investment.[8]

Commitment to continue stakeholder engagement

2024-2028 – The Project Team will convene the PSTAG quarterly to discuss progress, challenges, insights, and lessons learned for effective modernization.

2024 – The Project Team will convene a new stakeholder group to inform revisions to RIE's interconnection tariff to enable a new distributed energy resources program.

2024-2028 – The Project Team will convene an annual all-hands meeting, including field personnel, to understand challenges and implement process improvements.

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[1] The Project Team is prime applicant The Narragansett Electric Company d/b/a Rhode Island Energy (RIE) and team member PPL Services Corporation (PPL), a RIE affiliate.

[2] Throughout: "proposal" refers to the entirety of investments, actions, and tasks proposed herein.

[3] https://climatechange.ri.gov/act-climate/working-draft-workplan

[4] https://energy.ri.gov/sites/g/files/xkgbur741/files/2022-01/systems-integration-rhode-island-vision-document-january-2016-final.pdf

[5] The Power Sector Transformation report recommendations were informed by dozens of stakeholder organizations and hundreds of individuals, including state agency staff, national experts, industry, consumer advocates, low-income advocates, and environmental advocates.
https://ripuc.ri.gov/utilityinfo/electric/PST_home.html

[6] https://ripuc.ri.gov/eventsactions/docket/4770page.html

[7] https://ripuc.ri.gov/Docket-22-56-EL

[8] The Power Sector Transformation Advisory Group (PSTAG) has included members representing policy (RI OER), regulation (RI DPUC), municipal interests (City of Providence), customers in disadvantaged communities (City of Providence, Conservation Law Foundation, George Wiley Center for Justice), environmental advocates (Green Energy Consumers Alliance, Acadia Center), non-regulated power producers (Direct Energy), and renewable energy developer interests (Northeast Clean Energy Coalition, Smart Energy Power Alliance).

Meaningful Community and Labor Engagement

The Project Team is committed to meaningful engagement with community and labor stakeholders and build on this commitment with engagement specific to this proposal.

A legacy of engagement

For more than 175 years, RIE and its predecessor companies have provided reliable service to Rhode Islanders and have served the needs of Rhode Island communities. Over this time, RIE has developed many trusted relationships within these communities, which has allowed the utility to better understand the needs of those communities, and to serve them as more than just a power provider. Providing financial support for local non-profits, RIE continues to make a difference in the areas of education, sustainable communities, and DEIA. This year, RIE continued investing in RI through its Empowering Communities Grants program, funded by the PPL Foundation. Following a long legacy of giving back to the communities where RIE's employees live, work and play, this program provided $500,000 in funding to 29 nonprofit organizations. In future years, RIE anticipates investing $1.25 million in the community in the form of grants and sponsorships for community endeavors. These organizations give back to RI communities through advancing education access for DACs, environmental conservation, and innovative and affordable housing programs. In addition to financial contributions, RIE and PPL Corporation and its operating companies[9] have an equally strong commitment to volunteerism and community service.

Proposal-specific three-pronged engagement strategy

This proposal is built on nearly a decade of meaningful stakeholder engagement about decarbonizing RIE's power system generally, including five years of intensive discussions to refine RIE's Grid Modernization Plan (GMP), the blueprint from which this proposal is based. In this section, we elaborate on RIE's plans to continue robust engagement with stakeholders, communities, and labor throughout deployment and evolution of our smart grid.

The Project Team commits to continuing this legacy of stakeholder engagement in three ways, described in Task 7 of the Workplan and reflected via milestones and deliverables throughout the period of performance: (1) convene the PSTAG quarterly to discuss progress, challenges, insights, and lessons learned for effective modernization; (2) convene a new stakeholder group to inform revisions to RIE's interconnection tariff to enable a new distributed energy resources program; and (3) annual meetings with field personnel installing smart devices to understand challenges, implement process improvements, and gain insights.

Power Sector Transformation Advisory Group (PSTAG)

The Project Team will convene the PSTAG on a quarterly basis throughout the period of performance. In an order on its most recent rate case, the RI PUC ordered RIE[10] to refine its proposed grid modernization plan with the support of the PSTAG. The PSTAG was developed via collaboration between RIE, Rhode Island Office of Energy Resources (RI OER), and Rhode Island Division of Public Utilities (RI DPUC), with members representing environmental interests, clean energy industry or businesses, community groups, customers in disadvantaged communities, and non-regulated power producers. The PSTAG convened 19 times over the five years from

[9] PPL Corporation's operating companies include RIE, PPL Electric Utilities (PPL Electric) in Pennsylvania, and Louisville Gas and Electric (LG&E) and Kentucky Utilities (KU) in Kentucky.

[10] At the time, the order was given to The Narragansett Electric Company d/b/a National Grid.

2018-2022 (Figure 1). RIE filed the resulting GMP with the RI PUC in December 2022, and this proposal is in direct alignment with the GMP's blueprint for strategic investment into a smart grid for smart decarbonization, made even smarter with a legacy of stakeholder insights.

Fig. 1: PSTAG Meetings 2018-2022

Notes: PSTAG Meeting agendas included discussions regarding grid modernization, advanced metering, electric transportation, and energy storage.

Ongoing engagement with the PSTAG will ensure that the components included in this proposal are (1) deployed effectively and efficiently, (2) fully integrated with other grid modernization investments, and (3) resulting in realized benefits for customers. This engagement is described in Subtask 7.1 and reflected in quarterly milestones in the Workplan section of the Technical Volume. The Project Team will submit meeting materials as deliverables following each quarterly meeting. The Project Team will also discuss the role and insights of the PSTAG in its Final Report, with the objective of supporting replicable stakeholder engagement regarding grid modernization.

DER M/M Stakeholder Working Group (DER M/M SWG)

The Project Team will convene a working group of community members with a stake in amendments to RIE's interconnection tariff, enabling what is called 'DER Monitor/Manage' (DER M/M). As described in further detail in the Technical Description section of the Technical Volume, DER M/M is a functionality relying on Advanced Distribution Management System (ADMS) and its application Distributed Energy Resources Management System (DERMS) that enables the visibility of DERs and the ability to manage them.[11] This management ranges from ramping operations to full curtailment of an individual DER output, if needed, for distribution safety or reliability purposes. Where DERs are both visible and controllable, their operation can be managed to minimize negative impacts to the grid while optimizing the benefits to DER-owning customers and to other ratepayers. Visibility and controllability are prerequisites for fully integrating DER into the grid and is not available today at RIE.

The Project Team must ensure that implementing DER M/M is done in a manner that is practical with stakeholder buy-in. DER M/M uses field hardware that enables communications to monitor and manage DER. IEEE 1547-2018 certified Advanced Inverters will provide RIE access to a smart inverter's second communications port for monitoring and managing it. Optimization will occur by providing the interval energy and voltage data at the customer level

[11] Full technical details of DER M/M are described in the GMP, particularly in Attachment G: https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2023-01/2256-RIE-Book2-%20GMPlan.pdf

required for verification and settlement.

The Project Team intends to identify members of the DER M/M SWG in the first quarter of the performance period. Members will include, but are not limited to, renewable energy developers and/or their industry organization(s), including developers of both residential and commercial-scale systems; owners/operators and/or their representative organization(s), including residential, business, and industry representation; policy and regulatory organizations; subject matter experts, such as national labs[12] and/or inverter manufacturers; and others as appropriate.[13] This engagement is described in Subtask 7.2 and reflected in milestones within Budget Period 1, including at least six meetings. The Project Team will submit DER M/M SWG membership list, meeting materials and minutes, and the redlined interconnection tariff as deliverables for this task. The Project Team will also discuss the role and insights of the DER M/M SWG in both its DER M/M Case Study and its Final Report, with the objective of supporting replicable stakeholder engagement regarding DER interconnection.

Annual All-Hands Project Team Meeting

The Project Team will convene an annual all-hands meeting, including field personnel who install advanced reclosers, smart digital relays, smart capacitors and regulators, and fiberoptic cable. The objective of this annual meeting is to understand the challenges of installing smart devices in the field with the goal of putting in place process improvements. The Project Team recognizes that it is proposing to install a large number of field devices; annual meetings with field personnel is a strategy to mitigate risk of lag relative to planned installation cadence. This engagement is described in Subtask 7.3 and reflected in milestones within Budget Periods 2-5, including four meetings. The Project Team will submit meeting materials and minutes as deliverables for this task. The Project Team will also discuss the role and insights of the Annual Field Worker Meeting in its Final Report, with the objective of supporting replicable labor engagement regarding smart grid deployment.

Not only does the Project Team propose meaningful, robust engagement during the period of performance, the Project Team views these investments as enabling further engagement both within and beyond the period of performance via continued lock-step discussions with stakeholders to ensure accountability and usefulness.[14] Maintaining a longer-term roadmap will foster stakeholder engagement, aid in identifying synergies between projects, ensure maximization of net benefits, and create efficiencies through standardization. Cost recovery requests for smart grid investment will be made through annual ISR plans, which will provide the opportunity for annual assessment, review, and reporting (for more

[12] RIE has worked previously with National Renewable Energy Lab (NREL) and Lawrence Berkely National Lab (LBNL) on a conceptual framework for operating envelope agreements via the DOE-funding Solar Energy Innovation Network. RIE invites those NREL and LBNL team members to join the DER M/M SWG, with the objective of maximizing replicability and disseminating lessons learned from the engagement process.

[13] Stakeholder engagement in tariff amendments is consistent with prior tariff amendments (see: https://ripuc.ri.gov/eventsactions/docket/5077page.html). Leading up to this filing, stakeholders were engaged to understand consensus amendments and identify non-consensus issue for hearing before the RI PUC.

[14] The proposed work – all IT and OT – does not have the same sort of community impacts as traditional infrastructure projects, which can cause community concern or challenges. Therefore, it is more appropriate to have strategic stakeholder engagement through these channels other than by traditional means for steel-in-the-ground projects. Community managers and customer-facing staff will be trained and kept updated on project implementation, so they are prepared to respond to any inquiries from customers or communities.

information about RI's regulatory landscape, please see the Workplan within the Technical Volume). The Project Team will be accountable for progressing smart grid investments by implementing a rigorous and accelerated plan with the appropriate oversight and transparency. Accountability measures will include annual reporting of key metrics, RI PUC review and approval of annual ISR plan investments, as well as continued engagement with the PSTAG. These measures will ensure RIE will be held accountable for deploying solutions, reducing risks with the project, and realizing customer benefits in a timely manner.

The Project Team is also committed to continued engagement with broader industry groups to understand best practices and share insights. RIE, with its counterparts throughout PPL, is actively engaged in shaping grid modernization activities within the industry, including ongoing work with IEEE, Electric Power Research Institute, SEPA, and DOE (indeed, the Grid Modernization Plan has been shaped by these industry engagements).

Regarding stakeholder engagement related specifically to cybersecurity, the Project Team maintains a cybersecurity focused workgroup comprised of individuals who are trained, certified, and experienced in information and cybersecurity. Investment in, and ongoing assessment of our cyber skills is vital to the success of our cybersecurity function. This level of engagement and skills development enables the team to keep up with emerging threats, defenses design, and evolving technologies.

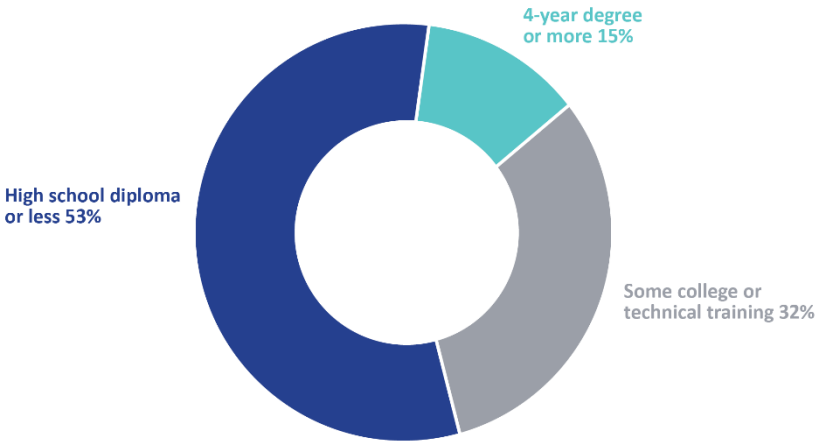
---------- **Investing in the American Workforce** ----------

The Project Team is committed to investing in the American workforce. RIE acknowledges and confirms that under Section 41101, all laborers and mechanics employed by RIE, contractors or subcontractors in the performance of construction, alteration, or repair work funded in whole or in part under DE-FOA-0002740 shall be paid wages at rates not less than those prevailing on similar projects in the locality, as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code commonly referred to as the "Davis-Bacon Act." Also, employees enjoy benefits such as on the job training. Currently, about 700 or 58% of RIE employees are represented by unions. The Project Team estimates approximately 90% of labor associated with the investments in this proposal would be performed by unionized workers.

RIE leads several external workforce development initiatives that support the community, including DACs, and build a pipeline of critical electric utility jobs. In 2022, RIE launched the Empowering Communities Grant program, funded by PPL Foundation, to support community organizations working to enhance education, workforce and community development and sustainability. 100% of funding in this first round of grants supported organizations serving DACs. Through partnerships with community organizations, RIE also supports pre-k through post-secondary education initiatives in the fields of Science, Technology, Engineering, Art&Design, and Mathematics (STEAM). For example, RIE holds a long-term partnership with the Providence Children's Museum, focusing on design theory and spatial learning for young children. In 2022, RIE sponsored the STEAM Educator Award, which recognizes exceptional K-12 educators that empower students in STEAM fields. The annual award provides financial support and personal awards to recipients. At the university level, RIE partners with Rhode Island Department of Education (RIDE) and the Rhode Island STEAM Center at Rhode Island College on STEM education and educators. To attract and retain qualified workers, RIE works with these organizations, is establishing an internship program,

and is hiring a full-time college recruiter. PPL's Powering Brighter Futures scholarship program fosters greater diversity in key fields and seeks to expand access to high-quality education for students in our communities. Funded by PPL Foundation, the program will award $150,000 annually to students who live within communities served by PPL's Pennsylvania and Rhode Island utilities. To further support workforce development efforts, non-traditional students, such as adult learners and those in need of funding in later years of their educational career, are also eligible to apply for scholarships.

Applying the methodology and analysis in Georgetown University's 2021 report, this proposed ~$300 million infrastructure investment could lead to 300-400 US jobs across the value chain.[15] Additionally, this study estimates over 80% of the jobs associated with infrastructure projects would not require a 4-year degree, and 50% of all jobs would require a high school degree or less (figure below, further detail about job training and retention is described in the DEIA section of the Community Benefits Plan). These jobs are particularly important opportunities for members of disadvantaged communities, who are less likely to have an advanced degree. These job impacts are aligned with the 2021 Act on Climate, which tasks the state with developing a strategy for a just transition for workers in fossil-fuel based industries. These jobs provide opportunities for individuals in DACs to participate in the project's economic benefits and are aligned with the federal funding's purpose to "drive the creation of accessible, good paying jobs." The proposed investments have the potential to increase local and state tax revenues that support government efforts to invest in communities and improve the quality of life for their citizens. Through direct and indirect economic impacts, the proposed magnitude of infrastructure investment has the potential to increase GDP up to $350 million to $450 million.[15]



PPL supports its employees' right to freedom of association as well as the right to form or join a union, bargain collectively and engage in union activities.[16] With 37% of workforce represented by labor unions, PPL Corporation's operating utilities collaborate with union leadership to enhance workplace safety, meet the growing expectations of customers, and adapt to the challenges of rapidly changing technologies. Among other things, employees are encouraged to participate in health and safety groups such as the safety advocate program and to join one or more business resource groups, which are employee-driven organizations formed

[15] Georgetown University Center on Education and the Workforce, *15 Million Infrastructure Jobs: An Economic Shot in the Arm to the COVID-19 Recession*, 2021. https://cew.georgetown.edu/cew-reports/infrastructure/

[16] RIE has not had any violations within the past two years under the National Labor Relations Act, Fair Labor Standards Act, Occupational Safety and Health Act, Service Contract Act, Davis-Bacon Act, or Title VII of the Civil Rights Act.

around common experiences and perspectives. Bargaining unit employees have access to a grievance procedure for internal dispute resolution. The grievance procedure promotes a prompt and responsible conclusion of issues raised by bargaining unit employees.

Commitment to DEIA

The Project Team is wholly committed to diversity, equity, inclusion, and accessibility (DEIA). For each of the proposed actions described in the FOA, the Project Team describes below how RIE and PPL are committed to advancing that action. All commitments and actions will be incorporated into the work described in this proposal, reinforced by (1) ongoing close collaboration between RIE's project management team and PPL's workforce development team; (2) accountability through annual environmental, social, and governance reporting; and (3) annual SMART DEIA milestones (reflected in the Workplan section of the Technical Volume). Each annual SMART DEIA milestone will track progress to engage with all personnel involved in carrying out this proposal. The Project Team will specifically track two metrics: total participation in the Annual All-Hands Project Team Meeting (see Subtask 7.3) and year-on-year changes in diversity of participants.[17] These metrics are important because they will reflect how the Project Team progresses with integrating all commitments below into this proposal and how the Project Team is improving overall over the entire period of performance.

The Project Team is committed to supplier diversity and identifying Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, and Veteran Owned Businesses to solicit as vendors, contractors, and subcontractors for bids on supplies, services, and equipment. In support of diverse businesses, PPL and its affiliate operating companies actively reach out to businesses owned by minorities, women, and veterans; host annual supplier networking events to attract business leaders who will help expand the diversity of PPL's supplier base; and serve as active members of various development councils that support diverse business suppliers. PPL has invested more than $50 million with the Energy Impact Partners' (EIP) global investment platform, which brings together leading companies and entrepreneurs worldwide to foster innovation toward a sustainable energy future. EIP's investment platform accelerates the shift to a low-carbon future and drives commercial-scale solutions needed to deliver deep, economy-wide decarbonization. PPL's collaboration with EIP includes participation in the EIP Elevate Council, which is focused on funding for diverse businesses in the industry. PPL also attends the National Minority Supplier Development Council (NMSDC) national conference to network with diverse businesses and the Eastern Minority Supplier Development Council, a regional affiliate NMSDC located in Pennsylvania. PPL is actively engaged with regional councils of the Woman's Business Enterprise Center in support of their efforts to identify qualified women owned business who could provide goods or services for its companies.

The Project Team is committed to identifying and partnering with workforce training organizations serving underrepresented individuals and those facing barriers to quality employment such as those with disabilities, returning citizens, youth in disadvantaged communities, and veterans. PPL and its operating companies, including RIE, seek to cultivate a diverse, equitable and inclusive culture where employees feel respected and engaged. And invest in the current and future workforce through training and development, succession

[17] The Project Team will propose a definition of diversity for review and approval by DOE.

planning and creating a pipeline for recruitment and internal advancement.

PPL and its operating companies, including RIE, empowers their employees to form and participate in business resource groups to foster an environment of inclusion and provide an opportunity for employees with common experiences and perspectives to network and engage in professional development opportunities. PPL's companies have a combined 17 business resource groups. Throughout the year, business resource group members organize employee events to educate fellow employees and build awareness on diversity and inclusion as well as professional development. Members are also actively involved in various cultural, community, and volunteer programs that enable them to extend their reach outside their workplaces.

The Project Team is committed to offering anti-bias training and education to ensure hiring professionals can recognize unconscious bias and can learn how to reduce discriminatory barriers. The Project Team recognizes the value of DEIA, especially within the context of the energy transition. PPL Corporation's family of companies, including RIE and PPL Electric, have established inclusion and diversity as a long-term strategic goal. In March 2022, PPL appointed a VP and Chief DEI Officer, who reports directly to the Chief Human Resources Officer, and is responsible for leading a team of four dedicated employees to advance strategic enterprise DEIA initiatives. One of these positions will be a RIE manager dedicated to progressing actionable DEIA initiatives that are tailored to the specific needs of RIE.

Over the next 24 months, PPL's internal DEI team will lead the implementation of critical anti-discrimination and anti-retaliation training for all 6,700 employees, including additional DEIA training for 1,585 company leaders. PPL also underwent an assessment of HR processes and identified several key DEIA initiatives that will result in attracting and retaining diverse and talented employees, including partnerships with community organizations to recruit diverse talent, and engaging with other HR functions to identify women and/or minority candidates for the succession plan and leadership development programs.

The Project Team is committed to supporting quality apprenticeship-readiness and/or pre-apprenticeship programs in the local community that are integrated with registered apprenticeship, including cyber apprenticeship-readiness programs and cyber-registered apprenticeship programs. PPL and its family of companies, including RIE, are taking a proactive approach to expanding the talent pool for positions that will be available in the next several years due to retirements. In addition to college co-op programs, PPL's operating companies have various apprenticeship programs for lineworkers, electricians, and craft workers in generation and natural gas operations. With the average apprentice program taking more than four years to complete, this is a long-term investment in the future workforce of RIE. PPL and its family of operating companies partner with community and technical colleges throughout their service territories in Kentucky, Pennsylvania, and Rhode Island to recruit top student talent. RIE partners with external organizations that provide workforce development training.

The Project Team is committed to partnering with organizations that can provide comprehensive support services such as training stipends, mental health supports, transportation assistance, and access to childcare resources to improve access to career-track training and quality jobs. PPL and its family of companies, including RIE, provide mental health support, access to childcare resources, elder care resources, financial planning resources, and other resources to its employees.

The Project Team is committed to hiring locally and equitably, including in its

recruitment preferences. The Project Team believes RIE can fuel innovation and growth – and strengthen RIE's culture – by fostering an inclusive workplace where all individuals are valued, respected, and belong. The Project Team also believes in leaning into RIE's diverse communities to promote education and understanding.

PPL has adopted diversity, equity and inclusion (DEI) commitments to strengthen its current workforce, attract future talent, and support the communities it serves. PPL is dedicated to making a long-lasting impact in its workplaces and communities through PPL's enterprise-wide diversity, equity, and inclusion commitments: attract, develop and retain a high-performing, diverse workforce; increase diverse representation in leadership roles, with a focus on historically underrepresented groups; maintain a workplace culture of equity and inclusion; and develop and sustain relationships with diverse suppliers, vendors and service providers. Ongoing actions related to these efforts include: identifying and partnering with influential community leaders to reach a diverse demographic for recruiting purposes; participating in diversity job fairs and advertising open positions with niche websites focused on job placement for minorities and females; providing leadership diversity training, including cultural competence and unconscious bias training; sponsoring and supporting business resource groups' initiatives, including professional development, and increased cultural awareness programs to bring about cultural and personal change in PPL and its family of operating companies and the community; and conducting pay equity reviews annually.

As a newly acquired company, RIE looks to PPL for guidance and resources to further develop its internal DEIA efforts, something PPL and its affiliates have already made significant progress towards. In fact, PPL Corporation received many awards in recognition of these efforts. As a result of its DEIA commitments, PPL Corporation was recently recognized for the second year in a row as one of 2022's "Top Utilities in the Nation" for its workforce diversity and inclusion by DiversityInc. PPL Corporation was recognized as one of the "Best Places to Work for Disability Inclusion" for three consecutive years from 2019 to 2021 earning a 100% on the Human Rights Campaign Foundation's Corporate Equality Index and has been named a "Best Place to Work for LGBTQ+ Equality" for six consecutive years.

More important than these awards, though, is the tracked progress that PPL and its affiliates have made through their DEI efforts. PPL Corporation has incorporated various DEI metrics into its Sustainability Report, promoting accountability toward action and measurable results. PPL Corporation has seen an increase in minority representation at the officer level from 6% to 14% since the adoption of DEI commitments. Making positive strides towards advancing gender parity in its workforce, women's advancement toward senior leadership also grew by 14% from 2020 to 2021. As of 2022, nearly 30% of officers and 40% of directors (up from 35% in 2020) were women.

Justice40 Initiative

The proposed investments in smart grid IT and OT solutions will benefit all customers in RIE's territory (nearly all customers in Rhode Island). IT investment will benefit all customers equally because IT platforms are used to manage the power system for all customers. OT investment will benefit all customers equally because the locations of these devices – and hence their impacts – are planned throughout the service territory based on load. The actual benefits derived from this investment will be at least equal across customers as the operational efficiencies flow to all customers in the form of less cost recovery through base rates.

Decrease in energy burden

RIE strives to keep energy affordable for its customers, for whom RIE's services are indispensable for everyday quality of life and economic growth. RIE's business strategy prioritizes affordability. Each of PPL's operating companies continually seeks to work more efficiently by eliminating redundancies, improving processes and using more automation to minimize costs while maintaining a high service level. This helps keep energy affordable for customers. While RIE's goal is to continue to reduce operating and maintenance expenses to further benefit customers, RIE also remains focused on helping its customers use energy wisely and provides a number of assistance programs to help vulnerable customers, such as an overall 25% or 30% discount off the total bill for qualifying customers, payment programs and more.

The Project Team also helps support programs and policies to reduce energy burden. RIE contributes to the Good Neighbor Energy Fund, which provides assistance to households unable to meet an energy expense due to financial difficulty. Through a cooperative effort between sponsoring energy companies, their employees and other donors, the fund is administered by United Way of Rhode Island. The Fund has assisted more than 47,750 families since its inception in 1986, and RIE is the acting chair utility. PPL advocates at the corporate level for robust federal funding for federal resources like the Low-Income Home Energy Assistance Program (LIHEAP), a program that makes annual grants to states, tribes, and territories to operate home energy assistance programs.

The Project Team commits to using 100% of federal funding to offset costs of the proposed investment for its customers, which would otherwise be recovered on an annual basis (see the Workplan section of the Technical Volume for a description of Rhode Island's regulatory landscape, including cost recovery and reconciliation through RIE's annual Electric Infrastructure, Safety, and Reliability Plan). By using federal funding to reduce cost recovery, the Project Team will have a substantial and measurable impact on reducing energy burden. The Project Team will track this benefit using the metric: $/kWh rate adjustment for customers.

Decrease in environmental exposure and burdens

PPL Corporation and its operating companies prioritize impact on the environment and communities they serve through responsible resource management, conservation of natural habitats and native species, and identification of culturally sensitive areas. PPL promotes conservation of natural resources, protection of biodiversity, pollution reduction and protection of the environment. PPL Corporation and its operating companies expect suppliers and contractors acting on their behalf to operate consistent with their environmental policy. PPL Corporation openly communicates its environmental commitments, actions, performance and policy, and listens to the concerns of stakeholders. PPL Corporation and its operating companies provide environmental education opportunities to their employees, customers, and the public. PPL Corporation and its operating companies engage with regulators, customers, employees, and the community to assess potential impacts of development activity, environmental initiatives, and actions stemming from company business activities. PPL's environmental policy statement provides guiding principles for how PPL Corporation and its operating companies operate while keeping the environment in mind and engage with our stakeholders.

Across RIE's service territory, RIE's teams work with various partners as RIE aims to minimize its operational impact on sensitive resource areas, protecting biodiversity and

ecosystems. In addition, RIE offers grants to environmental conservation organizations for community revitalization; supports research and development projects related to pollinator habitat protection; manages pollinator habitats at RIE facilities; works to identify and protect species of concern in proposed work areas; and provides trees and pollinator-friendly plants to county and municipal parks, environmentally focused groups and schools through various distribution programs. PPL Corporation and its operating companies work extensively to ensure the environment is protected while work is being done on the electrical system, especially in sensitive resource areas. PPL and RIE recognize the importance of conserving natural habitats and native species and work with various partners to protect habitats and biodiversity; engage with stakeholders when planning, building and operating our energy infrastructure; and support research on conservation practices.

The proposed smart grid investments enable DER, including electric heating and transportation. Electric heating and transportation may lead to better air quality, for example, by reducing criteria air pollutants from tailpipe emissions in traffic corridors. Rhode Island's traffic corridors are correlated with its historically redlined housing districts and its current environmental justice communities. According to the Rhode Island Department of Health, these communities are more likely to experience increased rates of asthma and negative health outcomes related to heat island effects.[18] By enabling smart decarbonization, these investments will help accelerate air quality improvements at lower costs. The Project Team will track both the number of environmental citations received (targeting zero citations over the period of performance) and renewable energy interconnected (MW) each budget period.

Increase in access to low-cost capital

RIE offers a 0% financing option for eligible investments through its energy efficiency program. Since its inception in 2011, 8,700 RIE customers have used this program to finance $58,000,000. To the extent that this proposal enables customers to invest in qualifying DER, then this proposal may also improve access to low-cost capital for interested customers.

High-quality job creation, the clean energy job pipeline, and job training for individuals

As discussed in the DEIA and Investing in the American Workforce sections, the Project Team is committed to supporting high-quality job creation, the clean energy job pipeline, and job training for individuals. Applying the methodology and analysis in Georgetown University's 2021 report, this proposed ~$300 million infrastructure investment could lead to 300-400 US jobs across the value chain.[19] The Project Team will track the number of personnel paid through this proposal and will track average wages.

Clean energy enterprise creation and contracting

As described in the DEIA section, the Project Team is committed to promoting supplier diversity, including through preferential and strategic recruiting. The Project Team will track year-on-year changes in diversity of personnel participating in the Annual All-Hands Project Team Meeting.

Energy democracy, including community ownership

[18] "Extreme Heat Impacts in Rhode Island Health Equity Zones" Rhode Island Department of Health. https://americanforests.maps.arcgis.com/apps/MapSeries/index.html?appid=b3084fedf3cd4b388f0763e96e260a1c

[19] Georgetown University Center on Education and the Workforce, *15 Million Infrastructure Jobs: An Economic Shot in the Arm to the COVID-19 Recession*, 2021. https://cew.georgetown.edu/cew-reports/infrastructure/

PPL Corporation and its operating companies contributed to the vitality and quality of life in the communities they serve through just and equitable community contributions, including philanthropy, volunteerism and economic development. PPL Corporation and its operating companies are committed to advancing a renewable energy future and empowering customers and communities to do the same. RIE has demonstrated its commitment to energy democracy by contributing $2.5 million to support the Rhode Island Commerce Corporation's Renewable Energy Fund, which provides grants for renewable energy projects that have the potential to produce electricity in a cleaner, more sustainable manner; supporting the RI's Renewable Energy Standard, which requires purchase of 100% renewable electricity by 2033; and offering two customer programs to encourage local renewable energy connections.

This proposal will increase in energy democracy by enabling quicker, lower-cost interconnection of distributed energy resources (including those that are customer owned and community remote/shared). The Project Team will track energy democracy using the metric of amount of residential renewable energy resources interconnected each budget period (MW).

Parity in clean energy technology access and adoption

PPL Corporation and its operating companies have a regulatory mandate to ensure access for all customers, and we design programs with special consideration for low-income customers to ensure parity. PPL Corporation's operating companies share important energy efficiency information with both business and residential customers on a regular basis. This information is distributed through online and television advertising, by mail, through digital means and in person. It includes home-energy analytics, energy-savings tips, and information about available energy efficiency rebates. In 2022, energy efficiency programs across PPL Corporation's operating companies helped customers save more than 439,000 megawatt-hours of electricity and reduced peak demand by nearly 67 megawatts.

Similar to improving energy democracy, this proposal will support increased parity in clean energy technology access and adoption by enabling quicker, lower-cost interconnection of distributed energy resources (including those that are customer owned and community remote/shared). The Project Team will track energy democracy using the metric of amount of residential renewable energy resources interconnected each budget period (MW).

Increase in energy resilience

PPL Corporation and its operating companies are actively monitoring and maintaining their systems, updating aging power lines and substations, building new ones, and incorporating advanced technology to keep power flowing to our customers. The proposed smart grid investments will have a clear positive impact on service reliability and resilience. The Project Team will track improvements in energy resilience using metrics System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI).

--- Benefits are expected to begin to flow in Budget Period 1, as soon as costs recovered from customers are offset by 100% of the federal award and personnel begin to receive payment for the proposed installations. Partial delivery of benefits will begin in 2024 (Budget Period 1). Full delivery of benefits will begin in 2028, when the full suite of IT and OT are deployed. The proposed investments have no anticipated negative or cumulative environmental impacts on disadvantaged communities or any other customer segment. As shown in the environmental questionnaires, neither the installation nor operation of the equipment pose any environmental risk.

Smart Grid for Smart Decarbonization:
Deploying advanced IT/OT to meet nation-leading clean energy mandates

FOA Number: DE-FOA-0002740
BIL – Grid Resilience and Innovation Partnerships (GRIP)
Topic Area 2: Smart Grid Grants (BIL section 40107)

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Project Location
State of Rhode Island

Notice of Restriction on Disclosure and Use of Data:
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Project Overview

Background: Smart grid investment needed for safe, reliable, affordable decarbonization

Clean, distributed energy resources and strategic electrification are necessary to mitigate climate change, but such investments are already creating new operational complexities for utilities across the country. With existing electric infrastructure, operators need adequate tools and technology to manage the grid and shifting dynamics of energy flows across it. Indeed, many grid operations are still conducted manually and supported by hand calculations. These methods will no longer be viable as increasing levels of Distributed Energy Resources (DER) require more frequent and flexible grid adjustments.

Project Goal: In this proposal, prime applicant and the grant recipient Rhode Island Energy (RIE) and team member and RIE affiliate and services company PPL Services Corporation (PPL) (together referred to as "the Project Team"), propose a comprehensive suite of information technology (IT) and operational technology (OT) to catalyze the unified *Smart Grid for Smart Decarbonization* concept to achieve the most advanced electric power system (EPS) in the nation, in the state with one of the most aggressive climate and clean energy mandates in the nation.

While each of these smart IT and OT systems independently offer value, their integration leads to synergies. The highly granular data coming from proposed investments in advanced reclosers, smart digital relays, and smart capacitors and regulators via the fiberoptic communications backbone is ingested and analyzed by Advanced Distribution System Management (ADMS) and Advanced Energy Management (AEMS; on the transmission system) software, which returns optimized directives to the OT devices. The centralized Asset Hub data system and an updated and integrated Geographic Information System (GIS) that represents a Digital Twin of the grid provide supporting business and planning optimization complementary to the ADMS and AEMS. The result is smarter use of RIE's existing grid as Rhode Islanders interconnect DER, electrify transportation and heating, and expect more from a 21st century EPS.

Rhode Island is an advantageous location for this work because of its nation-leading clean energy and climate mandates, its rich history of stakeholder engagement in grid modernization planning, and the commitment and experience of its primary utility. These factors put Rhode Island at the forefront of need, readiness, and capability for demonstrating a technology pathway to meet global climate challenges safely, reliably, and affordably. Rhode Island boasts one of the most aggressive decarbonized electricity mandates in the nation. Following extensive economic and energy analysis,[1] Rhode Island strengthened its Renewable Energy Standard in 2022, requiring the state to reach 100% renewable electricity by 2033.[2] Furthermore, RI's landmark 2021 Act on Climate[3] sets statewide, economy-wide greenhouse gas emissions mandates achieving net-zero in 2050, guaranteeing that transportation and thermal sectors will decarbonize alongside the electric sector. The state's *2022 Update* to its

[1] "The Road to 100% Renewable Electricity by 2030 in Rhode Island." 2020. https://energy.ri.gov/renewable-energy/100-percent-renewable-electricity-2030

[2] Chapter 26 Renewable Energy Standard. 2022. Vol. R.I. Gen. Laws. § 39-1-2 http://webserver.rilegislature.gov/Statutes/TITLE39/39-26/INDEX.htm

[3] 2021 Act on Climate (Rhode Island General Laws 42-6.2)

2016 Greenhouse Gas Emissions Reduction Plan[4] recognizes electrification as a proven and priority decarbonization strategy; this is supported by analyses and recommendations from the state's 2020 *Heating Sector Transformation*[5] and 2021 *Electrifying Transportation*[6] reports.

Recognizing the changing needs of the EPS, Rhode Island state agencies convened stakeholders, including RIE, to develop RI's 2017 *Power Sector Transformation*[7] Report. This evolved into a robust, multi-year (2018-2022) stakeholder process to develop and refine RIE's Advanced Metering Functionality Business Case (filed for regulatory review in November 2022) and Grid Modernization Plan (GMP; filed December 2022). Stakeholders representing environmental, consumer, supplier, policy, and regulatory interests heavily informed the extensive modeling that underlies RIE's proposed investments. The State's *2022 Update* to the *2016 Greenhouse Gas Emissions Reduction Plan* underscores the importance of grid modernization by calling out these investments as a priority action for the electric sector.[8] For a state with nation-leading climate and clean energy mandates, these investments will provide more than just local benefits – they will demonstrate to other utilities and states that safe, affordable, reliable deep decarbonization at scale is possible.

DOE Impact: This work will not proceed at this pace or scale without federal funding. Federal funding will accelerate investment in – and benefits from – the proposed IT/OT by up to two years and will expand the scope of smart IT investments to include Asset Hub and Digital Twin. The entirety of proposed investments will provide direct energy benefits to all RIE customers through improved reliability, quicker and less costly interconnections for DER, and faster deployment of electric vehicle (EV) charging stations at scale. Without federal funding, 100% of proposal costs[9] will be recovered from customers; if selected, federal funding will go directly to reducing costs for all Rhode Island customers. With the current macroeconomic landscape and historically high energy supply costs across New England, federal funding is also likely to expand the scale at which this investment occurs. Furthermore, the Project Team's proposed cost share (80% of total project costs) signifies the importance of the proposed work and grows the value of federal funding. The OT investments included in this proposal are scalable, and RIE may not be able to fund the full scale of investments in the timeframe targeted without federal funding.

Community Benefits: First, 100% of federal funding will directly reduce customer cost recovery. Second, the Project Team will continue RI's legacy of meaningful engagement through (1) continuing engagement through the Power Sector Transformation Advisory Group, (2) collaboration with stakeholders to launch a program to support more efficient integration of

[4] 2022 Draft Update to the 2016 Greenhouse Gas Emissions Reduction Plan "Act on Climate." 2022. https://climatechange.ri.gov/act-climate

[5] "Heating Sector Transformation." 2022. Official State of Rhode Island Website. State of Rhode Island Office of Energy Resources. July 27, 2022. https://energy.ri.gov/heating-cooling/heating-sector-transformation

[6] "Electrifying Transportation." 2022. Official State of Rhode Island Website. State of Rhode Island Office of Energy Resources. July 18, 2022. https://energy.ri.gov/transportation/electrifying-transportation

[7] "Power Sector Transformation." 2022. Official State of Rhode Island Website. State of Rhode Island Office of Energy Resources. July 20, 2022. https://energy.ri.gov/transportation/electrifying-transportation

[8] "2022 Update to the 2016 Greenhouse Gas Emissions Reduction Plan." 2022. Official State of Rhode Island Website. State of Rhode Island Executive Climate Change Coordinating Council. December 14, 2022. https://climatechange.ri.gov/act-climate/working-draft-workplan

[9] Throughout: "proposal" refers to the entirety of investments, actions, and tasks proposed herein. The total proposal cost is $285M, comprised of $50M federal share and $235M non-federal share (~80%).

DER onto the EPS, and (3) an annual meeting with personnel supporting smart grid deployment to understand challenges, needs, and opportunities for improvement.

Replicability: PPL Corporation's affiliate (PPL Electric) in Pennsylvania's successful grid modernization is a proof-of-concept for the integration of these advanced technologies, and the Project Team will put this modern grid to the test with RI's climate and clean energy mandates. Rhode Island's relatively high penetration of DER and its push toward strategic electrification offer the perfect climate to refine how we operate within a modern grid ecosystem. To maximize impact through replicability, the Project Team will develop a case study on its grid modernization investments, insights, and lessons learned.

---------- **Technical Description** ----------

Relevance and Outcomes: Proposal directly advances FOA objectives, improves grid flexibility

The EPS is changing significantly because of increasing adoption of additional renewable generation sources, including DER; beneficial electrification; EVs; electric heat pumps (EHPs); and advanced "smart" technologies that enable customers to actively manage energy use in their homes and places of business, and that transformation is expected to accelerate. This decarbonization transition has fundamentally changed the nature of EPS operations by prompting integration of DER and resulting in two-way power flow that is more dynamic and less predictable to manage to ensure safe and reliable electric service. The Project Team experiences these challenges in operating the EPS today. The increased complexity will grow as Rhode Island advances toward its climate and clean energy mandates.

RIE must invest in the necessary, real-time situational awareness of system conditions, together with the necessary control capabilities to mitigate system risks and facilitate future investment that further enhance the safety and reliability of the EPS while delivering increased benefits. The proposed IT and OT investments are a holistic solution to achieve the grid flexibility required for a decarbonized future. IT solutions – ADMS and AEMS, Digital Twin, and Asset Hub – are the requisite foundation for automated data processing and grid operations. Smart devices in the field both provide the granular data and carry out the commands given by the IT systems. The fiberoptic communications backbone connects the IT and OT to ensure these communications are received. With these interrelated investments in place, the Project Team will have transformed a first-generation, fossil-fueled analog EPS to the automated, digital platform needed to interconnect decarbonized DER and serve electric end uses, transportation, and heating. This proposal will:

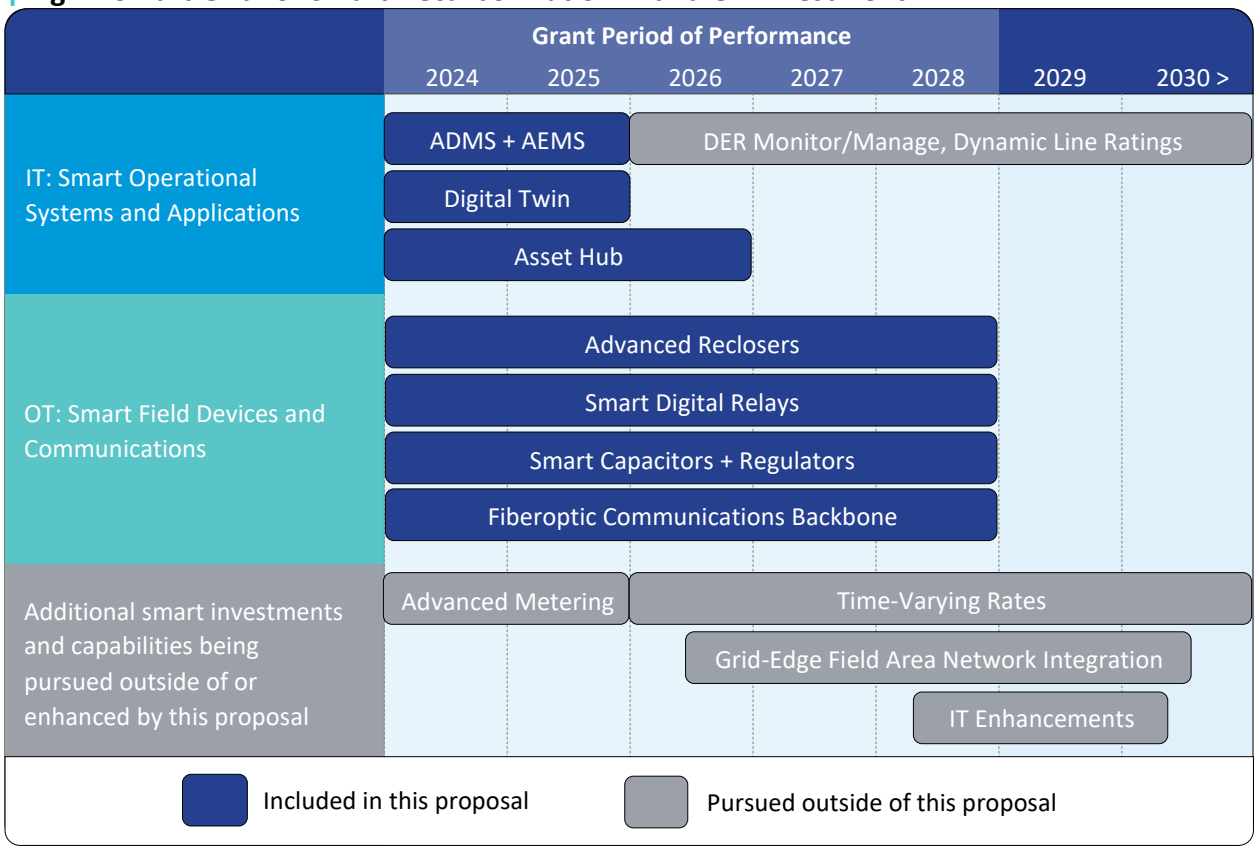
- increase the capacity of transmission facilities or the capability of the transmission system to reliably transfer increased amounts of electric energy;
- prevent faults that may lead to wildfires or other system disturbances;
- integrate variable renewable energy resources at the transmission and distribution levels; and,
- facilitate the aggregation and integration (edge-computing) of EVs and other grid-edge devices or electrified loads.

Supporting State Policy: This proposal and its intended outcomes directly advance RI's climate and clean energy mandates. These mandates require 100% renewable electricity by 2033 and economy-wide, statewide net-zero greenhouse gas emissions by 2050. To achieve these mandates, Rhode Island is anticipated to experience roughly a doubling of load and a three-fold increase in renewable energy; this proposal is necessary to provide the requisite grid flexibility.

The Project Team includes a letter of engagement from the Rhode Island Office of Energy Resources to further ensure alignment with state policy through continual engagement.

Feasibility: This proposal is both technically and practically feasible, backed by the demonstrated success and experience of the Project Team. One subset of the proposed investment is backed by intensive data-driven modeling and years of stakeholder engagement[10], as evidenced in RIE's Grid Modernization Plan (GMP), filed with the Rhode Island Public Utilities Commission (RIPUC) in December 2022. The GMP is a blueprint for smart grid investment in RIE's distribution system to address safety and reliability needs and to ensure that RIE is able manage the evolving electric distribution system efficiently and affordably in the future, while maintaining the flexibility to adapt to the actual pace of the energy transition through the adoption of DER and the shift to EVs, EHPs, and other forms of electrification.

Fig. 1: Smart Grid for Smart Decarbonization IT and OT Investment



The other subset of the proposed investments is backed by the success of PPL Corporation's affiliate in the digital transformation of its EPS. This playbook has been so successful – as demonstrated by measurable improvements in reliability, operational efficiency, and customer satisfaction – that PPL Corporation's other affiliates (including RIE) are adopting it. The proposed investment relevant to the transmission system are backed by this playbook, and the workplan described herein leverages lessons learned and team expertise.

[10] Stakeholder engagement was through RIE's Power Sector Transformation Advisory Group (PSTAG; 2018-2022). Stakeholders in PSTAG represent policy, regulation, low-income customers, environmental advocates, non-regulated power producers, and renewable energy developer interests, thereby ensuring comprehensive value of this portfolio and mitigating risks with its implementation.

Innovation and Impacts: The Project Team proposes an integrated suite of IT and OT smart grid investments to provide the requisite capability, visibility, and control grid operators need to manage complex two-way power flows.

| Table 1: Proposed Smart Grid IT and OT Investments

	Investment	Brief Description
IT	**Advanced Distribution + Energy Management Systems (ADMS and AEMS)**	ADMS is an enterprise software platform used by RIE to command and control the electric distribution system, including outage management and system operations. AEMS is the equivalent software platform used by PPL to command and control the electric transmission system, including outage restoration and system operations, including dynamic line ratings (DLR), smart alarms, and automated restoration.
	Digital Twin	Digital Twin is an upgraded GIS mapping software with a new Utility Network ESRI tool and Automated Utility Design (AUD) tool to supplement geographic mapping of physical assets with smart modeling of interactions (e.g., electrical, mechanical, communication) of each component on the EPS.
	Asset Hub	Asset Hub will centralize and maintain data related to infrastructure assets and analyze data (using artificial intelligence and machine learning) and recommend action to planners and operators.
OT	**Advanced Reclosers**	Advanced Reclosers are breaker equipped with a mechanism programmed to automatically close after it has been opened due to a fault, effectively sectionalizing the EPS so fewer customers are affected by any single outage.
	Smart Digital Relays	Smart Digital Relays are communication-ready relays that can adapt to power flow changes and other changes in system conditions with flexible settings, custom logic, and multiple settings groups, aimed to reduce outages and improves restoration time.
	Smart Capacitors and Regulators	Smart Capacitors and Regulators adjust system voltages up and down in a dynamic manner to accommodate the variable output of DER technologies and increase grid flexibility.
	Fiberoptic Communications Backbone	The Fiberoptic Communications Backbone will support communications to and from substations to significantly improve data flow, reliability, and resiliency of communications.

Each individual IT and OT technology is described below, but these individual technology elements should not be considered individually, rather as components purposefully designed to function together to optimize benefits for the power system and customers.

> IT investments: putting the smart into 'smart grid'

ADMS and AEMS intelligently processes data for automated operations.

Current levels of DER penetration, which will increase as Rhode Island decarbonizes, result in rapid changes on the EPS and two-way power flow. Whereas grid operators could previously manage the power system manually, these complex electrical dynamics necessitate

an automated approach to grid operations.

On the distribution side: ADMS is a combination of the software platforms Outage Management System (OMS), Distribution Management System (DMS), distribution supervisory control and data acquisitions (SCADA), and Distributed Energy Resources Management System (DERMS). ADMS provides the grid operator with a unified view of the distribution network and connects to smart field devices to enhance situational awareness and grid control. ADMS improves the management of outage restoration, automates processes, and provides data on critical grid functions including fault location, peak demand management, and isolation and restoration of potential problem areas. Furthermore, ADMS will integrate with SCADA software, interconnecting asset health systems and respective data repositories to build a more comprehensive digital ecosystem. The analogue to ADMS on the transmission side is AEMS, which also enhances operators' ability to command and control the transmission system, including outage restoration and system operations. The Project Team will upgrade RIE's distribution operating center to have ADMS, and PPL's transmission operating center to have an upgraded version of AEMS.[11]

Federal funding will accelerate full deployment of the ADMS suit of applications by up to two years, including the addition of applications Fault Location Isolation and Service Restoration (FLISR), Volt/Var Optimization (VVO), Conservation Voltage Reduction (CVR) and dispatch. The Project Team will expand innovation using DERMS, which allows grid operators to monitor and forecast DERs remotely and is the foundation for a program called DER Monitor/Manage (DER M/M). In DER M/M, grid operators communicate with smart inverters to make minor adjustments warranted by hyper-local grid conditions in the few hours each year they may be needed. By doing so, DER can interconnect to the grid more strategically, thereby reducing system modification costs and enabling deeper decarbonization. The Project Team will develop a case study on the stakeholder process to revise RIE's interconnection tariff to allow for DER M/M to maximize impact and replicability. Federal funding will unlock the upgrade to AEMS, including a transmission-level digital twin and dynamic line ratings (DLR). The Project Team will use existing transmission data and data incoming from transmission-level sensors as they are deployed to develop a digital geographic representation of the transmission system to support planning and decision-making based on granular transmission system needs. The upgrade will allow the Project Team to develop DLR for the transmission system. DLR has the express benefit of increasing transmission capacity, a key objective of this FOA.

The Project Team will mitigate risks associated with ADMS and AEMS by leveraging lessons learned through prior experience and through a carefully designed workplan with deliberate rollout and stakeholder engagement. RIE has experience with its VVO pilot on 10% of its distribution system. This proposal will result in full, territory wide VVO implementation and

[11] PPL's Affiliates ("Affiliate Applicants") are also submitting applications for federal funding under DE-FOA-0002740 Topic Area 2 to support ADMS, AEMS, Asset Hub, and Digital Twin, which are enterprise-wide systems. The Project Team assures there will be no duplication of federal funding: each Affiliate Applicant only includes each Affiliate's cost ration for these enterprise-wide line items. In this instance, the Project Team only includes the cost of ADMS, AEMS, Asset Hub, and Digital Twin allocated to RIE. Furthermore, each Affiliate Applicant submits its cost share proposal does not include duplicative federal funding. In this instance, the Project Team's cost share is derived from RIE-based cost recovery. In summary: there is no potentially duplicative federal funding risk; awarding more than one Affiliate Applicant will not result in duplicative federal funding.

will leverage both RIE's and PPL's experiences with VVO to mitigate risks with deployment and operation. The Project Team will draw on insights and lessons learned from PPL Electric's DER Management Pilot when revising RIE's interconnection tariff to allow for DER M/M to mitigate regulatory and industry risk. The Project Team's stakeholder engagement plan (described in more detail in Subtask 7.2 and in the Community Benefits Plan) brings industry, policy, and regulatory stakeholders to the table to inform and develop practical program design and tariff provisions for DER M/M. The Project Team will also leverage PPL's experience with transmission system DLR to ensure effective deployment and operation.

Digital Twin: The groundwork for smart modeling, planning, and decision making

Many utilities have a geographic information system (GIS) toolkit to map EPS assets and support modeling used for planning and analysis; this basic GIS was suitable for one-way power flows and predictable system loads. However, the complex electrical dynamics we see today necessitate a more realistic, granular, and dynamic mapping tool.

The Project Team will upgrade its GIS mapping software with a new Utility Network ESRI tool and Automated Utility Design (AUD) tool, collectively referred to as a Digital Twin. Digital Twin supplements geographic mapping of physical assets with smart modeling of interactions (e.g., electrical, mechanical, communication) of each component on the EPS. The new model allows planners to run virtual grid simulations to understand the implications of introducing new assets to the EPS. The Project Team will fully integrate Digital Twin with ADMS, Asset Hub (described below), and existing software like the Project Team's cloud database, integration hub, 3D mapping and design software. By assembling geospatial information on grid assets and modeling the numerous relationships and interactions between grid components, Digital Twin enhances the value of smart grid investments with smarter decision making. Smart decision-making means improved planning and integration of new assets to the existing EPS; analyzing assets, subcomponents, and relational data; and understanding potential two-way power flow.

Smarter decision making can lead to operational cost efficiencies and reductions, improved service reliability, and a superior customer experience. Digital Twin will allow for more precise and potentially proactive identification of equipment failures, quicker and more efficient routing of field repair technicians, and reduced outage durations for customers. By integrating enhanced GIS functionality with customer service interfaces, the Project Team will also improve customer experience with better outage reporting and visibility into service routes and schedules. The Project Team will leverage insights and capabilities from its previous experiences to mitigate risks associated with deployment and use. Federal funding unlocks this investment, which will not occur but-for federal funding.

Asset Hub consolidates and organizes data for efficient operations

To take care of RIE's smart grid, the Project Team will create what it's calling the Asset Hub to centralize, maintain, and analyze data related to infrastructure assets. This data includes critical historical information about each asset (e.g., maintenance history, age, manufacturer, historical performance, etc.) and real-time telemetry data (e.g., temperature, voltage, frequency, etc.) collected via current field sensors (i.e., reclosers). In addition to housing this rich data, Asset Hub will have capabilities to analyze data (using artificial intelligence and machine learning) and recommend action to planners and operators. The Project Team will build out this capability by programming algorithms based on business rules. For example, Asset Hub will be able to make assessments about a particular asset's health and flag when that

asset is likely to need repairs, before the asset actually breaks, incurs damage, or causes an outage. Altogether, Asset Hub will support service reliability and operational efficiency.

Federal funding will unlock Asset Hub. The Project Team will leverage PPL's years of data-driven analysis to support the implementation and use of Asset Hub. The Project Team is committed to smart, data-driven analysis to reduce operational cost through efficiency.

> **Smart OT operationalizes IT insights**

Advanced reclosers improve reliability

An advanced recloser is a breaker equipped with a mechanism programmed to automatically close after it has been opened due to a fault. Advanced reclosers also effectively sectionalize the EPS such that a single segment of a feeder serves fewer customers; in other words, sectionalizing the grid means fewer customers are affected by any single outage. Advanced reclosers are necessary OT components to operationalize ADMS functionality.

Advanced reclosers provide the requisite data and operational functionality to improve service reliability. Unlike traditional reclosers, advanced reclosers can communicate with ADMS: advanced reclosers can send data to ADMS to analyze and can receive instructions from ADMS on how to operate. When used in combination with ADMS, advanced reclosers allow for load control and near real-time (typically within seconds) power measurements. The enhanced sensing and data communication from advanced reclosers is the OT requirement to operationalize ADMS's FLISR application. This combination of IT and OT reduces the number of permanent outages by automatically reclosing if a fault is detected. If multiple attempts to reclose are unsuccessful (meaning the fault persists), the advanced recloser will open and remain open, then communicate information about the fault event to ADMS's FLISR application. ADMS FLISR, advanced reclosers, and other smart devices work in tandem to automate power restoration by homing in on the location of the fault, isolating the fault, and redirecting power to as many affected customers as possible, reducing both the impact and duration of power interruptions.

The Project Team will install 1,561 advanced reclosers to improve service reliability by operationalizing OT systems and sectionalizing the power system. The Project Team determined the number and location of reclosers (which include both mail line and tie point advanced reclosers) based on three criteria: (1) customer segmentation targets, (2) long-term system configuration, and (3) DER penetration. The Project Team set an objective to sectionalize the electric grid into segments of 500-customers or less. To avoid unnecessary investment and optimize proposed locations for the advanced reclosers, the Project Team took into consideration alternative operational solutions that called for the reconfiguration or conversion of certain circuits. The Project Team further refined the proposed locations of the advanced reclosers based on DER penetration on each feeder. DERs reduce available fault current and can desensitize protection equipment; advanced reclosers can mitigate these impacts.

These additional advanced reclosers represent a quadrupling of advanced reclosers RIE has already deployed across its service area: 574 advanced reclosers on over 235 feeders; 62 midline reclosers and 107 reclosers at the point of common coupling due to customer requests for DER interconnections and 377 midline reclosers in the course of business as usual to maintain and improve safety and reliability, address damage and failure, and as part of asset replacement. Quadrupling RIE's fleet of advanced reclosers not only improves service reliability by sectionalizing the distribution system but can reduce the frequency and duration of

permanent outages that customers experience via full integration with ADMS.

The proposed expansion and acceleration of advanced reclosers in conjunction with all IT and OT investment is expected to result in real reliability improvements. Table 2 summarizes these expected improvements, as estimated using detailed system modeling based on actual outages over the prior five years. This table demonstrates how if RIE had the proposed investments, outages could have been prevented or shortened. In addition to the reliability benefits, reclosers offer numerous other advantages, such as improved system visibility, system configuration flexibility, enhanced protection capability, voltage data to improve VVO, and a host of operational efficiencies.

The Project Team recognizes the risk of supply chain delays to procuring the magnitude of equipment needed for the proposed IT and OT expansion. The Project Team, however, believes that the risk of delay is likely due to the time required for manufacturers to expand production capabilities; lead times for advanced reclosers are now 34-36 weeks. As a result, the Project Team reserved a substantial number of production slots to mitigate supply chain delays. If existing manufacturers are unable to meet the entirety of the orders, the Project Team is prepared to engage in new vendor relationships to ensure successful delivery within the proposed deployment timeframe.

Table 2: Advanced reclosers improve reliability and resilience

Day Type	Blue Sky Day		Major Storm (IEEE TMED)	
Customers per recloser	500	1000	500	1000
Customers interrupted (CI)	207,191	207,191	143,120	143,120
Total CI with advanced reclosers	79,500	159,000	61,100	122,200
Delta CI	127,691	48,191	45,825	15,690
SAIFI improvement	0.258	0.097	0.092	0.032
SAIDI improvement	16.96	6.42	75.14	25.73

Notes: Data from actual circuit breaker and recloser events January 2017-December 2021; 495,622 total customers served. Blue sky day assumes: 159 events; Customer Average Interuption Duration Index (CAIDI)=66 minutes; automated switching takes <1 minute. Major storm assumes: 122 events; CAIDI=813 minutes; 75% successful operations during storms. SAIFI/SAIDI = System Average Interuption Frequency/Duration Index

Smart digital relays enhance system visibility and control amid increasingly variable generation

Rhode Island's decarbonization mandates will result in removal of the inertia-based generation that has long stabilized system frequencies and replace it with variable sources that require more intelligent monitoring devices. Relays are devices that monitor and adjust characteristics related to power quality. Intelligent and automated decision-making is becoming more important than ever for RIE to maintain operating costs, safety, and provide electric service reliability. Electromechanical relays, which are predominate in substations, are dated and provide little data or flexibility that will be needed to manage and operate in the future. Smart digital relays (microprocessor relays) can adapt to power flow changes and other changes in system conditions with flexible settings, custom logic, and multiple settings groups. Additionally, the fault location information provided by digital relays reduces outages and reduces the time field technicians spend searching for issues. Improving how the power system is monitored and controlled can provide operations and maintenance benefits that exceed the initial capital investment. The Project Team will upgrade solid-state, first-generation

electromechanical relays to new, smart, communication-ready digital relays over five years. The Project Team inventoried and categorized electromechanical relays based upon upgrade complexity and ease of replacement. 32 relay replacements will utilize the existing PPL standard for pre-wired relays within an outdoor enclosure. 87 relay replacements will be installed within the breaker itself and will require development of a new PPL standard.

There are many advantages to upgrading old electromechanical, solid-state, and first-generation electromechanical relays. Reliability improves because there is less direct wiring and interconnection wiring. Reliability and security of multifunction logic and settings are improved with next-generation user interface software. Remote input/output modules, remote analog/digital inputs, and thermal measurement capabilities have expanded protection, control, and monitoring capability. New protection and monitoring features improve power system equipment life and increase personnel safety. Maintenance costs are reduced, while internal watchdogs alert the user if the relay has a problem. Settings groups can be changed instantaneously to adapt to varying power system requirements. Digital relays offer a variety of secure communications capabilities for interfacing with Smart Grid controls, SCADA systems, and business networks. Event memory is larger for more on-board, standardized oscillographs and event reporting. Data from the upgraded relays is used in conjunction with software to predict failures before they occur, respond faster to incidents, and integrate data with business processes to make RIE more efficient and reliable which will result in customer savings, improved services, and increased customer satisfaction.

Smart Capacitors and Regulators

For a customer's electrical equipment to operate as expected, it must be connected to a source that is operating within an allowable voltage range which is +/- 5% of the nominal value. Coincident voltages along the distribution system will vary by location on the feeder, and the voltage at any delivery point will also vary with time. In the past, voltage regulation was relatively predictable. With one-way power flows, voltage tended to "drop" from the head-end of the feeder to the remote-ends of the feeder due to the resistance of the wires and the distribution of load along them. To compensate for this voltage drop, capacitors and voltage regulators have traditionally been installed to boost the voltage to stay within the required voltage range. Because electrical resistance of the system and the load cycles were very predictable, the control settings on capacitors and regulators were simple, autonomous, and only needed to be adjusted occasionally in concert with periodic planning reviews. With current levels of DER penetration, simple autonomous settings are insufficient for RIE to maintain compliance with voltage standards.

To alleviate these issues, The Project Team will replace or upgrade 808 capacitors and 80 regulators with Smart Capacitors and Regulators that adjust system voltages up and down in a dynamic manner to accommodate the variable output of DER technologies. Accelerated deployment of smart capacitors and regulators with advanced controls will provide voltage and reactive power control to enable management of voltage along the distribution feeder within required ANSI voltage standards. The accelerated deployment of smart capacitors and regulators will also integrate with the ADMS application VVO, resulting in savings and operational benefits.

Fiberoptic Communications Backbone

Currently, leased cellular communications are used to communicate with automated

devices in substations and with automated devices that were installed on distribution lines. Leased cellular service is limited in bandwidth and is subject to greater interference, resulting in risk of inadequacy during both mundane communication with controllable devices and in emergency situations. Cellular, especially when used as a backhaul carrying significant data traffic that is critical to operations, jeopardizes system reliability and resiliency.

The Project Team will deploy a private fiberoptic network in Rhode Island to support communications to substations where it will be used to backhaul information from substations. This investment will replace leased cellular services to improve data flow, reliability, and resiliency of communications. The backhaul fiberoptic communications backbone will consist of 142 miles of fiberoptic cable and will reduce RIE's annual operations and maintenance costs.

Replicability at Scale: This proposal will reduce perceived risk for project deployment, lead to further deployment at scale, and lead to additional private sector investments. Perceived risk will be reduced through case studies, industry communication, and real demonstration of technical feasibility, success, and impacts. Reduced risk is likely to lead to deployment of smart grid technologies in other states and utility territories preparing their EPSs for smart decarbonization. Altogether, these investments are likely to lead to additional private sector investment from clean energy and smart grid industries.

Workplan

Project Objectives: Enable smart decarbonization on schedule, on budget, and equitably

The goal of the proposed smart grid investment is to enable smart decarbonization, such that the State of Rhode Island can meet its climate and clean energy mandates safely, reliably, and affordably. In doing so, the Project Team will demonstrate to the nation a viable path to aggressive decarbonization at scale. In developing this proposal and workplan, the Project Team has the following project objectives:

1. Leverage the Project Team's collective expertise and strong stakeholder relationships to develop a practical, efficient, and just-in-time deployment plan that results in successful project deployment and meaningful community engagement.
2. Invest in "no-regrets" foundational solutions first as determined by extensive data-driven electrical analysis and decarbonization scenario modeling.
3. Defer to stakeholders with first-hand understanding to make sure plans for deployment, cost recovery, and ongoing operations work for all customers, with special focus on underrepresented customers in disadvantaged communities (DACs).[12]

[12] The Project Team adopts DOE's definition of disadvantaged communities (DACs) based on July 20, 2021, Memorandum for the Heads of Departments and Agencies from Shalanda D. Young, Brenda Mallory, and Gina McCarthy. DACs are "either a group of individuals living in geographic proximity to one another, or a geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions" where those conditions may include, but are not limited to, "low income, high and/or persistent poverty; high unemployment and underemployment; racial and ethnic residential segregation, particularly where the segregation stems from discrimination by government entities; linguistic isolation; high housing cost burden and substandard housing; distressed neighborhoods; high transportation cost burden and/or low transportation access; disproportionate environmental stressor burden and high cumulative impacts; limited water and sanitation access and affordability; disproportionate impacts from climate change; high energy cost burden and low energy access; jobs lost through the energy transition; and access to healthcare." The Project Team used the Climate and Economic Justice Screening Tool (CEJST) as its primary tool for assessing

Regarding Objective #1, the Project Team's collective expertise is described in the Qualifications section of this Technical Volume and supported by team member resumes. A description of prior robust stakeholder engagement and planned future engagement is described in the Community Engagement section of the Community Benefits Plan. The Project Team's workplan is described in depth below. This workplan is just-in-time based on extensive data-driven electrical modeling and scenario analysis as referenced in Objective #2.[13] Objective #3 references the in-depth discussions held by the Power Sector Transformation Advisory Group, described in detail in the Community Engagement section of the Community Benefits Plan. There are several significant outcomes expected as a result of these proposed investments:

- Anticipated 30% improvement in reliability
- $50,000,000 reduction in costs otherwise recovered from customers
- An anticipated increase in available load and hosting capacities for strategic electrification and distributed renewable generation

The Project Team has designed its workplan and its reporting schedule to track progress toward these outcomes via SMART goals.

Technical Scope Summary: During the 60-month period of performance, the Project Team will deploy an integrated suite of IT and OT investments: ADMS + AEMS, Digital Twin, and Asset Hub; and advanced reclosers, smart digital relays, smart capacitors and regulators, and a fiberoptic communications backbone. Together, these investments will provide the capabilities, visibility, and control grid operators need to deliver safe, reliable, affordable, decarbonized power to customers.

Strategy to comply with Buy America requirements: *The proposal will involve the construction, alteration, maintenance and/or repair of public distribution and transmission utility infrastructure within the United States. While, for the purposes of this FOA, the Project Team, which is a for-profit entity as defined in the FOA, is not required to comply with the Buy America Act or the Build America, Buy America Act requirements ("Buy America" requirements) for the FOA infrastructure projects, RIE will exercise reasonable efforts, to the extent possible, to source materials within the United States, as available and appropriate, including, but not limited to, based on lead times.*

Work Breakdown Structure (WBS) and Task Description Summary: The Project Team divides its workplan into discrete performance periods aligned with Rhode Island's annual capital investment regulatory review requirements. Rhode Island's Revenue Decoupling Act requires RIE to file an annual investment plan for "(1) capital spending on utility infrastructure; (2) operation and maintenance expenses on vegetation management; (3) operation and maintenance expenses on system inspection, including expenses from expected resulting repairs; and (4) any other costs relating to maintaining safety and reliability that are mutually agreed upon by the [Division of Public Utilities and Carriers] and [RIE]." [14] This annual

impacts of proposed projects on disadvantaged communities. Where appropriate, the Project Team supplemented its analysis using tools developed by Rhode Island state agencies.

[13] This analysis is described in detail in Section 5 of RIE's Grid Modernization Plan (the Project Team does not describe the details of this analysis here due to page length constraints, but eagerly refers reviewers to this resource for more information) https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2023-01/2256-RIE-Book2-%20GMPlan.pdf

[14] http://webserver.rilin.state.ri.us/Statutes/title39/39-1/39-1-27.7.1.HTM

investment plan, called the Electric Infrastructure, Safety, and Reliability Plan (ISR Plan), covers applicable spending for the fiscal year (FY) ending on March 30. Spending is reconciled on an annual basis through the same ISR Plan and regulatory oversight. Quarterly compliance reports are also required to track progress and ensure accountability.

The Project Team developed its workplan to align with this annual cadence of regulatory filings, with the regulatory decision representing the go/no-go decision point between each period of performance. The intent of this decision point is to adjust proposed spending-down of federal funding to align with actual planned work and cost share. The Project Team views this structure as particularly advantageous for two reasons. First, having certain decisions about deployment schedules and spending on an annual basis mitigates risk of unspent federal funding. Second, the public utilities commission is required by statute to render a decision within 90 days, which mitigates the risk of delays and sliding schedules.[15]

End of Project SMART Goal: The End of Project SMART Goal is 100% installation of all IT and OT components described in the Technical Description section on the Technical Volume. The expected outcomes of 100% installation are the reliability improvements, cost reductions, and increased load and hosting capacities, reporting for which is described in the subsection above. To ensure progress toward the End of Project SMART Goal, the Project Team sets Annual SMART Technical Goals related to progress toward 100% installation. Expected progress for each IT and OT component is detailed in Table 4, below.

Project Management: Throughout its workplan, the Project Team identifies the lead for each task and subtask, as well as key team members. The specific qualifications of these personnel are detailed in the Qualifications section of the Technical Volume and supported by their resumes (included in application materials). Kathy R. Castro (Principal Investigator), Director of Asset Management and Engineering for RIE and James Conrad, Director of Product Portfolio for PPL, will lead OT and IT deployment, respectively, leveraging their years of technical and team management experience. Carrie A. Gill, Ph.D., Senior Manager of Regulatory Strategy for RIE will coordinate stakeholder engagement activities leveraging the capabilities of RIE's External Affairs team. The Project Team includes a specific Task for project management, led by Castro, to demonstrate the organization with which RIE and PPL approach project management. This project management task will support all critical handoffs and interdependencies. Critical interdependencies arise when stakeholder feedback needs to flow to/from technical teams. The WBS was developed such that all critical handoffs remain within the same team, under the same lead, to ensure success. In such situations, task leads will be well prepared to communicate via a biweekly internal meeting. Furthermore, all members of the Project Team work closely together on a wide variety of workstreams, so the Project Team will build on experience and prior lessons learned to ensure successful handoffs and interdependencies.

Two notable characteristics of the Project Team's project management strategy: First, the Project Team differentiates between internal project management and check-ins with DOE; this demonstrates the inherent motivation RIE and PPL have to be successful regardless of

[15] Furthermore, the Project Team will be able to adjust the workplan to its regulatory schedule during contract negotiations for complete alignment; this flexibility allows the Project Team to hit the ground running regardless of when award selection is made; thereby mitigating inherent risk that comes with uncertainty about start date for period of performance when crafting this application.

external pressure and should signal to reviewers the commitment of the Project Team to ensuring success. Second, the Project Team plans for quarterly updates to RIE and PPL leadership at the highest levels, including RIE's President and PPL's Chief Executive Officer and Chief Operating Officer; this level of communication showcases the importance of this work to future business strategy and ensures federal funding is used responsibly and meaningfully.

The Project Team has developed its workplan, using the above objectives, to successfully achieve key outcome-based and SMART milestones with the flexibility needed to stay on budget and on schedule. Resulting tasks and subtasks are described below in relation to milestones, deliverables, and go/no-go decision points, and disaggregated by budget period.

| Table 3: Tasks, subtasks, deliverables, and milestones

Task 1: Project Management and Planning (Lead: Castro)

Subtask 1.1: Project Management Plan (Lead: Castro) – Month 1
Develop PMP within first 30 days of the award; the PMP will include an explicit workplan for filing a proposal with the RI PUC on reduction of cost recovery due to availability of federal funding; *Deliverable*: Project Management Plan

Subtask 1.2: NEPA Compliance (Lead: Castro) – Months 1-3
Determine applicability and provide documentation for NEPA compliance

Subtask 1.3: Cybersecurity Plan (Lead: Randle) – Months 1-60
The CSP shall be revised and resubmitted as often as necessary, during the course of the project, to capture any major/significant changes; *Deliverable*: Cybersecurity Plan

Subtask 1.4: Continuation Briefings (Lead: Castro) – Months 1-60
Brief DOE on roughly an annual basis to explain the plans, progress and results of the technical effort; describe performance; *Deliverable*: Pre-Continuation Briefing Documents

Task 2: Install ADMS and prepare for DER M/M (Lead: Conrad)

Subtask 2.1: ADMS DMS, OMS, FLISR, VVO, DERMS, CVO (Lead: Conrad) – Months 1-24
Build, install, test, and deploy the Digital Twin for the electric distribution system; Build, install, test, and deploy an ADMS platform consisting of traditional DMS and OMS functionality and with advanced features to include FLISR, VVO, CVR, DERMS

Subtask 2.2: AEMS (Lead: Conrad) – Months 1-24
Build, install, test, and deploy the Digital Twin for the electric transmission system; Build, install, test, and deploy an AEMS platform that operationalizes DLR

Subtask 2.3: Interconnection Tariff Amendments (Lead: Gill) – Months 1-24
Revise RIE's interconnection tariff to be compatible with DER M/M; coordinate internally with Johnson, Grant, Schuster, Russell Salk, Castro, Constable; *Deliverable*: Tariff Amendments

Subtask 2.4: Produce deliverables (Lead: Gill) – Months 22-24
Entails writing, incorporating feedback from stakeholders and SMEs; *Deliverable:* Case Study

Task 3: Build and launch Digital Twin (Lead: Conrad)

Subtask 3.1: Initialization (Lead: Conrad) – Months 1-12
Initialization includes data includes data assessment, source data mapping, and initial data pilot; develop infrastructure architecture & prototyping

Subtask 3.2: Finalization (Lead: Conrad) – Months 13-18
Finalization includes Mock 1 & Mock 2 data migrations; infrastructure development, and system configuration design and build; AUD configuration and modeling with system integration, system acceptance, and user acceptance testing phases

Subtask 3.3: Produce deliverables (Lead: Gill) – Months 19-24
Case study on Digital Twin; includes at least three interviews with operators to understand what works well, what challenges remain, and lessons learned; *Deliverable:* Case Study on Digital Twin

Task 4: Build and launch Asset Hub (Lead: Conrad)

Subtask 4.1: Data collection (Lead: Conrad) – Months 1-24
Map asset health, life-cycle, and data source; build master data and life cycle status

Subtask 4.2: Rules engine (Lead: Conrad) – Months 13-30

Develop, test, and refine business rules for use in Asset Hub to automate processing of data

Subtask 4.3: Produce deliverables (Lead: Gill) – Months 30-36
Entails writing, vetting of case study; incorporating insights; at least three interviews with operators who work with Asset Hub on what works well, what the challenges are, and lessons learned; *Deliverable*: Case Study on Asset Hub

Task 5: Smart Field Devices and Communications (Lead: Castro)

Subtask 5.1: Advanced reclosers (Lead: Castro) – Months 1-60
Deploy and validate 1,339 advanced reclosers in the field

Subtask 5.2: Smart digital relays (Lead: Castro) – Months 1-60
Deploy and validate 171 smart digital relays in the field

Subtask 5.3: Smart capacitors and regulators (Lead: Castro) – Months 1-60
Deploy and validate 742 smart capacitors and regulators in the field

Subtask 5.4: Fiberoptic communications backbone (Lead: Castro) – Months 1-60
Deploy and test 100 miles of fiberoptic cable; locations of deployment strategized to match locations of smart field devices such that benefits from those devices can begin to accrue

Task 6: Integration and Cybersecurity (Lead: Randle)

Subtask 6.1: Ongoing integration of OT and IT (Lead: Conrad) – Months 1-60
Continued verification that OT and IT are working together seamlessly and accurately

Subtask 6.2: Cybersecurity protocols and verification (Lead: Randle) – Months 1-60
Ongoing work to assure cybersecurity best practices are in place

Task 7: Engagement (Lead: Gill)

Subtask 7.1: PSTAG (Lead: Grant) – Months 3-60
Convene PSTAG on a quarterly basis through both virtual and in-person meetings; agendas will each include report out on progress, planned work, lessons learned, and insights, with time for stakeholder discussion, feedback, and questions; liaise with leads for Tasks 1-6; *Milestones*: quarterly meetings; *Deliverables*: PSTAG Meeting Materials

Subtask 7.2: DER M/M Stakeholder Working Group (Lead: Gill) – Months 1-12
Identify members, develop agendas, coordinate at least 6 meetings, compile feedback, develop meeting materials, liaise with Castro and Conrad to translate stakeholder insights into interconnection tariff amendments; *Milestones*: stakeholders identified, 6 meetings held, tariff amendments developed; *Deliverables*: Membership List, Meeting Materials and Minutes

Subtask 7.3: Annual All-Hands Project Team Meeting (Lead: Glenning) – Months 6, 18, 30, 42, 54
Convene annual meetings for all members of the Project Team, including personnel who install smart field devices; coordinate meeting logistics; develop agendas and meeting materials; liaise with Castro to share insights for continuous improvement; liaise with Evans to share insights related to DEIA; *Milestones*: five annual meetings; *Deliverables*: Meeting Materials and Minutes

Task 8: Project Management (Lead: Castro)

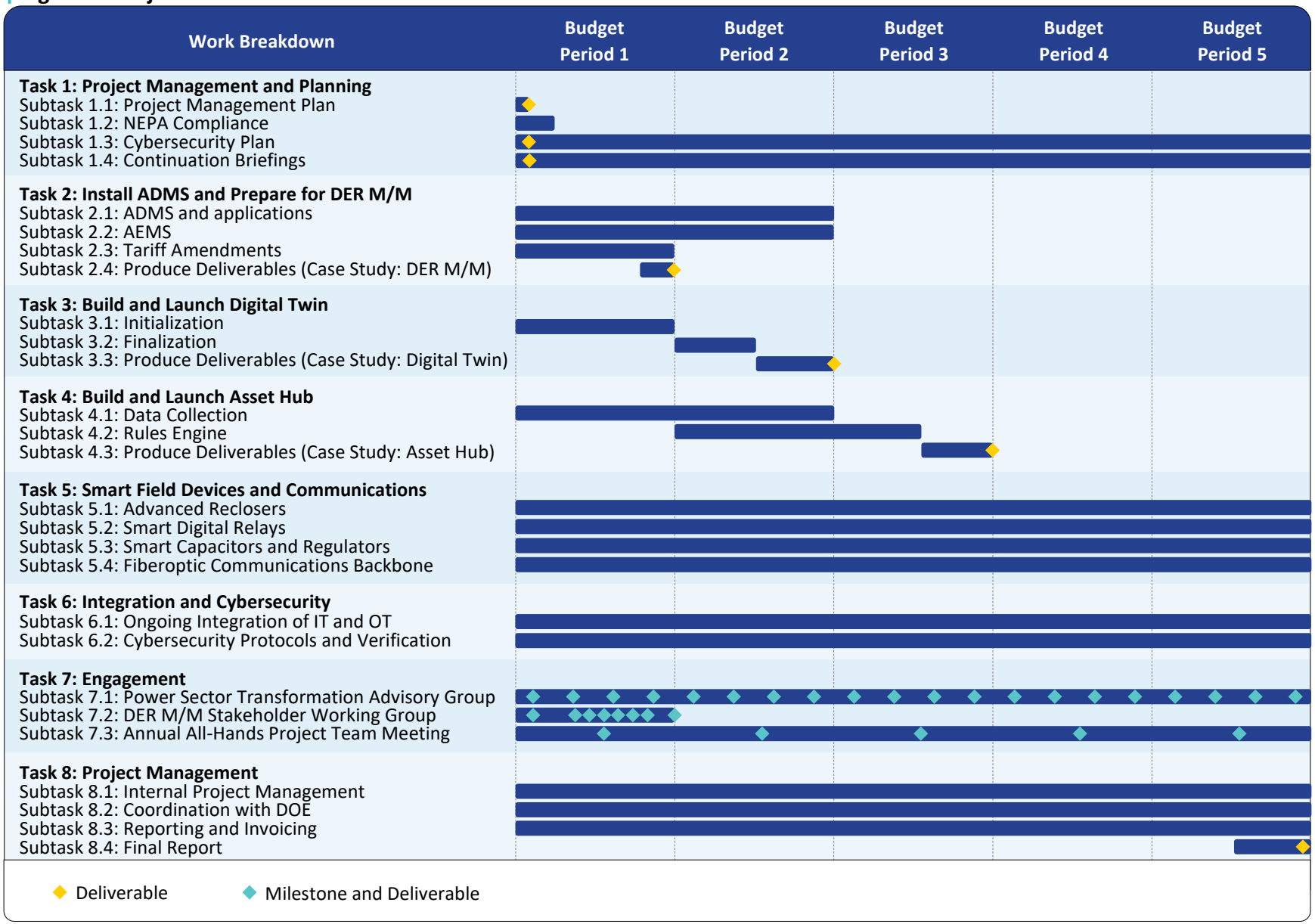
Subtask 8.1: Internal project management (Lead: Begnal) – Months 1-60
Biweekly internal meetings with the Project Team to assess progress, identify and resolve issues, share insights, and make progress; quarterly internal meetings to report out and receive guidance from RIE and PPL leadership

Subtask 8.2: Coordination with DOE (Lead: Begnal) – Months 1-60
Meetings with DOE grant manager, staff, and other DOE-sponsored events to share insights and progress; providing briefings; adjustments to the workplan due to annual approval cycle of Electric ISR Plan at each go/no-go decision point

Subtask 8.3: Reporting and invoicing (Lead: Grzesiuk) – Months 1-60
Quarterly financial and performance reporting; other reporting as required

Subtask 8.4: Final report (Lead: Gill) – Months 54-60
Develop the final report to include all case studies, additional insights, recommendations for future research and funding, best practices and lessons learned from community engagement, and steps for replicability; *Deliverable*: Final Report, including drafts for review and feedback

Figure 3: Project Schedule



Milestones Summary and Go/No-Go Decision Points: Table 4 summarizes the expected outcomes of each budget performance period, go/no-go decision points, engagement milestones, and Annual Technical SMART Milestones, along with expected deliverables. Milestones specify stakeholder, community, and labor engagement for each quarter of the 60-month performance period. As detailed in the Community and Labor Engagement section of the Community Benefits Plan, the Project Team commits to three distinct spheres of engagement, all of which will strengthen this project and its outcomes:

1. Stakeholder Engagement: The Project Team will report out to and receive feedback from its Power Sector Transformation Advisory Group on a quarterly basis.
2. Community Engagement: The Project Team will convene a DER M/M Stakeholder Group to inform interconnection tariff amendments, the design of the DER M/M program, and to support process and impact evaluation of DER M/M. These insights will also be captured in the Case Study on DER M/M so that lessons learned can be replicated.
3. Labor Engagement: The Project Team will hold an annual meeting with field personnel charged with installation of smart devices and fiberoptic cable. The intent of this annual meeting is to understand how installation and related processes might be adjusted to improve safety, efficiency, and productivity. These lessons learned will inform continuous improvement and will be captured in the Final Report on Smart Grid for Smart Decarbonization.

These three spheres of engagement are further described within Task 7, below. The intent of calling out engagement as its own task is not to signal that the engagement will be isolated from the technical deployment of IT and OT investments, rather to highlight the emphasis the Project Team places on ensuring this engagement is done properly. Leads for engagement will work hand-in-hand with leads for deployment tasks (Tasks 2-6) throughout the period of performance to ensure full integration of engagement with deployment.

Table 4: SMART milestones and go/no-go decision points

Event	Timing	Description/Expected Outcome
BP1	Months 1-12	• ADMS OMS, DMS, FLISR, VVO 75% installed • AEMS 75% installed • Digital Twin initial release • Asset Hub initial data collection 50% complete • Installation of smart field devices and fiberoptic communications backbone 22% complete • Interconnection tariff amendments developed
M1.1	Month 3	*Deliverable*: Project Management Plan • DER M/M Stakeholder Group identified for interconnection tariff amendment (at least 10 stakeholders) *Deliverable*: DER M/M Stakeholder Group Membership List • PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M1.2	Month 6	• At least 3 DERM M/M Stakeholder Group meetings *Deliverable*: Meeting Materials and Minutes ○ PSTAG Meeting *Deliverable*: PSTAG Meeting Materials • Annual All-Hands Project Team Meeting *Deliverable*: Meeting Materials and Minutes
M1.3	Month 9	○ At least 3 DERM M/M Stakeholder Group meetings *Deliverable*: Meeting Materials and Minutes • PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M1.4	Month 12	• Interconnection tariff amendments developed • PSTAG Meeting *Deliverable*: PSTAG Meeting Materials

Event	Timing	Description/Expected Outcome
Annual SMART Milestones		• *Annual SMART Technical Milestone*: % installed relative to project goal by IT and OT component (as specified in the BP1 expected outcomes row, above) • *Annual SMART DEIA Milestone*: participation in Annual All-Hands Project Team Meeting; year-on-year improvement in diversity of participants
Go/No-Go	Month 12	• Regulatory approval of FY 2025 Electric ISR Plan
BP2	Months 12-24	• ADMS OMS, DMS, FLISR, VVO 100% installed • ADMS CVO 100% installed • ADMS DERMS 50% installed • AEMS 100% installed • Digital Twin final release • Asset Hub initial data collection 100% complete • Asset Hub rules engine 50% initialized • Installation of smart field devices and fiberoptic communications backbone 46% complete • Interconnection tariff amendments approved
M2.1	Month 15	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M2.2	Month 18	○ PSTAG Meeting *Deliverable*: PSTAG Meeting Materials • Annual All-Hands Project Team Meeting *Deliverable*: Meeting Materials and Minutes
M2.3	Month 21	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M2.4	Month 24	*Deliverable*: Case Study on Digital Twin • PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
Annual SMART Milestones		• *Annual SMART Technical Milestone* criteria: % installed relative to project goal by IT and OT component (as specified in the BP2 expected outcomes row, above) • *Annual SMART DEIA Milestone*: participation in Annual All-Hands Project Team Meeting; year-on-year improvement in diversity of participants
Go/No-Go	Month 24	• Regulatory approval of FY 2026 Electric ISR Plan
BP3	Months 25-36	• ADMS DERMS 100% installed • DER M/M initialized • Asset Hub rules engine 100% initialized • Installation of smart field devices and fiberoptic communications backbone 69% complete
M3.1	Month 27	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M3.2	Month 30	○ PSTAG Meeting *Deliverable*: PSTAG Meeting Materials • Annual All-Hands Project Team Meeting *Deliverable*: Meeting Materials and Minutes
M3.3	Month 33	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M3.4	Month 36	• *Deliverable*: Case Study on Asset Hub • PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
Annual SMART Milestones		• *Annual SMART Technical Milestone*: % installed relative to project goal by IT and OT component (as specified in the BP3 expected outcomes row, above) • *Annual SMART DEIA Milestone*: participation in Annual All-Hands Project Team Meeting; year-on-year improvement in diversity of participants v
Go/No-Go	Month 36	• Regulatory approval of FY 2027 Electric ISR Plan
BP4	Months 37-48	• DER M/M up and running • Installation of smart field devices and fiberoptic communications backbone 91% complete
M4.1	Month 39	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials

Event	Timing	Description/Expected Outcome
M4.2	Month 42	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials • Annual All-Hands Project Team Meeting *Deliverable*: Meeting Materials and Minutes
M4.3	Month 45	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M4.4	Month 48	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
Annual SMART Milestones		• *Annual SMART Technical Milestone*: % installed relative to project goal by IT and OT component (as specified in the BP4 expected outcomes row, above) • *Annual SMART DEIA Milestone*: participation in Annual All-Hands Project Team Meeting; year-on-year improvement in diversity of participants
Go/No-Go	Month 48	• Regulatory approval of FY 2028 Electric ISR Plan
BP5	Months 49-60	• Installation of smart field devices and fiberoptic communications backbone 100% complete • All deliverables complete
M5.1	Month 51	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M5.2	Month 54	*Deliverable*: Case study write up on DER M/M ○ PSTAG Meeting *Deliverable*: PSTAG Meeting Materials • Annual All-Hands Project Team Meeting *Deliverable*: Meeting Materials and Minutes
M5.3	Month 57	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
M5.4	Month 60	• PSTAG Meeting *Deliverable*: PSTAG Meeting Materials
Annual SMART Milestones		• *Annual SMART Technical Milestone*: % installed relative to project goal by IT and OT component (as specified in the BP4 expected outcomes row, above) • *Annual SMART DEIA Milestone*: participation in Annual All-Hands Project Team Meeting; year-on-year improvement in diversity of participants

Notes: BP = Budget Period; MX.Y = Milestone corresponding to BPX, quarter Y; Go/No-Go = Go/No-Go Decision Point. RIPUC = Rhode Island Public Utilities Commission. The Electric ISR Plan is RIE's annual capital investment plan covering April 1 through March 30; each plan is denoted with an FY (fiscal year) where that year corresponds to the fourth quarter of the plan. For example, FY 2024 Electric ISR Plan corresponds to planned investments April 1, 2023 through March 30, 2024.

Any project changes will be handled swiftly and appropriately. Changes that arise due to annual approval cycles for RIE's Electric ISR Plan will be incorporated into the workplan via Subtask 8.2 in complete coordination with DOE staff. Changes that arise due to unforeseen events will be discussed and vetted both internally (Subtask 8.1) and with DOE staff (Subtask 8.2) as soon as those unforeseen events are known.[16]

The Project Team does not foresee any risks other than those described within this application. Risk mitigation strategies specific to reach risk are described throughout this application. The Project Team also views its stakeholder engagement plan as a risk mitigation strategy: transparency, accountability, and stakeholder insights will ensure work is completed efficiently and effectively throughout the period of performance. The Project Team's overall risk management strategy is illustrated in Figure x, demonstrating risk management through the entire lifecycle of the project: preemptive mitigation, advanced notice via monitoring and reporting, close and constant communication, transparency, flexibility, and feedback loops.

[16] Please note that no unforeseen events are predicted at this time; all known risks have been described in this application packet (specifically concentrated within the Technical Description section of the Technical Volume) to the best of the Project Team's ability.

Technical Resources and Qualifications

Team Qualifications: The Project Team bring holistic experience and expertise

The Project Team is highly qualified, with decades of combined experience and demonstrated success in grid modernization, complex investment, and utility management. Prime applicant RIE serves nearly 97% of the state's customers (nearly 500,000 customers). In 2016, Rhode Island was the first state in the country to deploy offshore wind. In 2019, RIE contracted for an additional 400 MW of offshore wind and is currently procuring up to another 1,000 MW. In total, this generation is expected to supply 70% of RI's electricity needs in 2030 (including the new demand required for electrification). Currently, RIE's electric grid has 504 MW of interconnected DG and ~650MW more in queue.

RIE also has a history of robust stakeholder engagement, described in further detail in the Community Benefits Plan. This history includes five years of engagement with the Power Sector Transformation Advisory Group (PSTAG). Resulting from a commission order, the PSTAG was developed via collaboration between RIE, Rhode Island Office of Energy Resources (RI OER), and Rhode Island Division of Public Utilities (RI DPUC), with members representing environmental interests, clean energy industry or businesses, community groups, customers in disadvantaged communities, and non-regulated power producers. The PSTAG convened 19 times over the five years from 2018-2022 (Figure 4) and ultimately informed RIE's Grid Modernization Plan (filed for regulatory review in December 2022).

Fig. 4: PSTAG Meetings 2018-2022

Notes: PSTAG Meeting agendas included discussions regarding grid modernization, advanced metering, electric transportation, and energy storage.

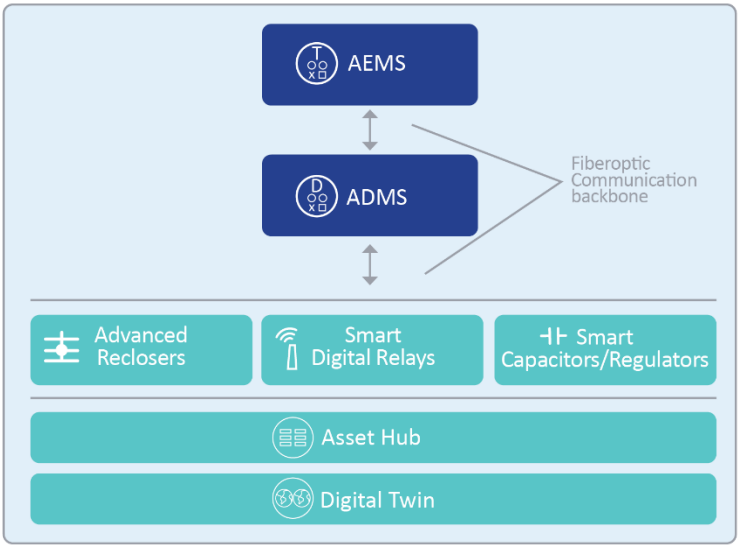
Through its experience in supporting its affiliates, team member PPL brings industry-leading experience and capabilities in deploying innovative edge of grid modernization technologies. Team member PPL's affiliate utility companies serve more than 3.2 million customers and are widely regarded as leaders in customer satisfaction and innovative grid solutions. PPL's affiliate in Pennsylvania (PPL Electric) deployed a DERMS.[17] Results from the pilot show a substantially strong benefit-cost ratio, leading to shorter interconnection times,

[17] *Petition of PPL Electric Utilities Corporation for Approval of Tariff Modifications and Waivers of Regulations Necessary to Implement its Distributed Energy Resources Management Plan* (DER Management Pilot); see also "Getting Ready for a Renewable Energy Future." 2020. PPL Corporation. July 14, 2020. https://www.pplweb.com/blog/getting-ready-for-a-renewable-energy-future/#:~:text=PPL%20Electric%E2%80%99s%20Distributed%20Energy%20Resource%20Management%20System%20is

lower interconnection costs, and better power quality. PPL Electric won the 2022 Smart Grid Award for its use of advanced sensors and switches to improve grid reliability in Pennsylvania.[18]

PPL's and RIE's existing equipment and facilities are sufficient to facilitate successful completion of this project; no new equipment or facilities are needed nor proposed as part of this project.[19]

Fig. 4: Visual Summary of Proposed Investment



Key Team Members: Within the Project Team, the following individuals will bring their deep and multidisciplinary knowledge to deliver these proposed investments and intended outcomes. Below, the Project Team describes the roles, time commitments, and relevant expertise and experience of these team members in relation to the proposed work at hand. Resumes for the following key team members are included in the application package.

Kathy Castro (PI) – Director of Distribution Planning and Asset Management, RIE

Castro is the principal investigator on this proposal and serves as both the technical point of contact and the lead project manager. Castro will specifically lead the deployment of OT solutions (Task 5) and Project Management (Tasks 1 and 8). Castro brings nearly two decades of utility industry experience in analysis and design, project management, corporate management, marketing, and business development. As the lead technical expert for RIE's Grid Modernization Plan, her involvement will ensure the work proposed in this project is in lockstep with investments needed to deliver safe, reliable, affordable, decarbonized electricity to customers. Furthermore, Castro's role with overseeing all distribution investment will ensure full integration with the investments proposed herein and all other investments occurring as normal course of business; thereby ensuring efficient work schedules, adequate and capable workforce, and synergistic activities in the field. Castro will allocate 10% of her time to this work over the 60-month period of performance.

Jim Conrad – Director of Product Portfolio, PPL

Conrad is the lead technical manager for all IT solutions (Tasks 2-4) and for integration of IT and OT (Subtask 6.1). Over the past decade, Conrad has been a recognized leader in innovative utility information technology. In addition to his current role leading PPL's IT Product Team, Conrad has held leadership roles in field engineering and operations at PPL Electric. His electric distribution experience includes work on many new technologies, including automated

[18] Larson, Aaron. 2022. "Advanced Power Grid Sensors and Switches Reduce Downtime and Improve System Reliability." POWER Magazine. July 1, 2022. https://www.powermag.com/advanced-power-grid-sensors-and-switches-reduce-downtime-and-improve-system-reliability/

[19] The Project Team is not requesting technical services from DOE/NNSA FFRDCs.

fault isolation, downed conductor detection, and DER Management. Conrad has the technical experience and background to ensure the successful implementation of the proposed investments, demonstrated through his work on the Keystone Solar Futures Grant and through his patent for a megavang design from his time in the Distribution Standards department. Conrad will allocate 10% of his time to this work over the 60-month period of performance.

Chris Randle – Vice President of Cybersecurity, PPL

Randle will lead integration and cybersecurity (Task 6) by supporting integration (Subtask 6.1) and leading cybersecurity protocols (Subtask 6.2). Randle's vast experience demonstrates his impressive qualifications for this role. He has more than 20 years of experience in cybersecurity, creating and executing strategies that protect Fortune 500 companies from advanced cyber threat activity. In his current role, he is responsible for the cyber safety of all PPL operating companies, including RIE. He focuses on creating and managing the strategic success of cybersecurity in the organization including the following areas: Identity and Access Management, Privileged Access Management, Cloud Security, Risk Management, Incident Response, Cyber Monitoring, ICS/OT Security, Cyber Awareness and Training, Cyber Engineering, Product Security, Vulnerability Management, CIP Compliance and SOX Compliance. He will allocate 200 hours to this work.

Brian Grzesiuk – Senior Financial Manager, RIE

Grzesiuk is the lead financial manager and business point of contact for this proposal. In leading Subtask 8.3, Grzesiuk will leverage his existing work with tracking performance and spending for capital investments to ensure quality and timely reporting. Grzesiuk's five-year tenure with RIE has led to his fluency in both financial and performance reporting. Grzesiuk leads a team of two, responsible for budgeting and forecasting for operating and capital expenditures, long-term business planning, and supporting the strategic, operational, and financial decision making for the Electric Business. Brian has a successful track record overseeing budgets and capital plans, which will further support the team in meeting milestones on time and on budget. By leveraging these synergies, Grzesiuk is able to efficiently allocate 380 hours to this project over the 60-month period of performance.

Carrie Gill, PhD – Senior Manager of Electric Regulatory Strategy for External Affairs, RIE

Gill will lead engagement generally (Task 7) and specifically coordination of the DER M/M Stakeholder Group (Subtask 7.2) and development of interconnection tariff amendments (Subtask 1.3). By leading both subtasks related to DER M/M, Gill will be able to ensure stakeholder feedback is considered and work directly with technical team members to marry stakeholder feedback with technical needs. In her role within External Affairs, Gill conducts ongoing stakeholder engagement, including as RIE's liaison with the Rhode Island Distributed Generation Board, constituents of which are prime candidates for the DER M/M Stakeholder Group (Subtask 7.2). Gill will also lead the development of all project deliverables (Subtasks 2.4, 3.3, 4.3, and 8.4), in addition to providing general support for project management. Gill's extensive experience with project management of federal grants, state and federal policy expertise, and industry experience will ensure deliverables meet the dual needs of supporting internal learnings and maximizing external impact through replicability. She will allocate 700 hours for this work.

Ryan Constable – Manager of Distribution Planning, RIE

Constable will provide critical support for OT deployment (Task 5), IT/OT integration

(Subtask 6.1), and engagement (Task 7). Constable has nearly two decades of utility planning experience and is a recognized expert in the field. Constable not only leads a team of planners, but also supports RIE's grid modernization planning efforts, including intensive modeling to understand RIE's needs as the state decarbonizes. Constable was instrumental as a partner on Rhode Island's Solar Energy Innovation Network Team (DOE funding competitive cooperative agreement, 2020-2022, Project Team led by Rhode Island Office of Energy Resources). His experience demonstrates both the depth of his expertise and breadth of his knowledge base. He will allocate 10% of his time to this work.

Dan Glenning – Director of Project Management, RIE

Glenning will lead the annual worker meeting described in Subtask 7.3, with the support from the External Affairs team, Human Resources department, and staff focused on labor and worker relations. Glenning will allocate 60 hours to these meetings, in addition to 200 hours supporting workforce hiring and project management for OT (Task 5).

Nicole Begnal – Manager of Electric ISR Plan, RIE

Begnal will lead internal project management (Subtask 8.1) and coordination with DOE (Subtask 8.2) and will support Grzesiuk with reporting (Subtask 8.3). Begnal's position already requires her to collaborate closely with Grzesiuk to not only track performance and spending of projects included in the Electric ISR Plan, but also to work with planners (Castro and Constable) and project managers (Glenning) to develop and defend practical capital investment plans. Leveraging her existing approach to collaboration, Begnal will allocate 570 hours to this work over the 60-month period of performance.

Kate Grant – Senior Manager of Regulatory Affairs, RIE

Grant will lead coordination of the Power Sector Transformation Advisory Group (Subtask 7.1), provide particular support for interconnection tariff amendments (Subtask 2.3) and provide general support for project management, particularly with ongoing updates to regulatory staff. This will build on her extensive experience overseeing Power Sector Transformation Advisory Group engagement since its formation in 2018 and serving as RIE's key liaison to regulatory stakeholders. Her priority areas of focus in recent years have included advanced metering, grid modernization, customer assistance, and demand side initiatives through a Governor appointed and senate confirmed role on the Rhode Island Energy Efficiency and Resource Management Council. Grant will allocate 200 hours to this project.

Erica Russell Salk – Manager of Customer Energy Integration, RIE

Russell Salk will support all facets of DER M/M Stakeholder Group (Subtask 7.2) and development of interconnection tariff amendments (Subtask 2.3). As the manager of the Customer Energy Integration team, Russell Salk and her team have developed deep relationships with renewable energy developers and installers. Not only will she bring these insights into consideration when engaging with the DER M/M Stakeholder Group, but she will bring back insights from the DER M/M Stakeholder Group to her team to amplify process improvements and provide additional value to the interconnection process. Furthermore, Russell Salk's deep working knowledge of the interconnection tariff will help the Project Team streamline its focus in developing amendments, resulting in efficient and productive discussions. Russell Salk will allocate 162 hours to this work.

Beth Johnson – Director of Regulatory Affairs, PPL

Johnson will provide regulatory expertise in support of interconnection tariff

amendments (Subtask 2.3), as well as general support to ensure federal funding is accounted for in ratemaking to offset cost recovery from low-income customers. Johnson not only oversees a team of regulatory analysts, she has direct leadership experience in successfully implementing PPL Electric's DERMS through its *Petition of PPL Electric Utilities Corporation for Approval of Tariff Modifications and Waivers of Regulations Necessary to Implement its Distributed Energy Resources Management Plan* (DER Management Pilot).[20] Johnson's first-hand knowledge and expertise will transfer institutional knowledge and lessons learned to ensure success in Rhode Island. Johnson will allocate 200 hours to this project.

Angie Evans – Vice President and Chief DEI Officer, PPL

Evans will provide support for and oversight of all work related to the Community Benefits Plan, including but not limited to progressing DEIA actions and reporting on annual SMART DEIA milestones. In Evans' role as VP and Chief DEI Officer, she is responsible for advancing PPL's enterprise-wide diversity, equity and inclusion strategy and commitments. Evans will focus her efforts on joining quarterly leadership meetings and planning for and participation in each Annual All-Hands Project Team Meeting (Subtask 7.3). She will allocate 100 hours to this project.

David Bonenberger – President, RIE

Bonenberger will serve as the lead decision-maker and provide general support, leadership, and guidance to this project. Bonenberger's prior roles bridge the PPL and RIE teams: Prior to RIE, Bonenberger held the roles of VP of Operations Integration at PPL, through which he led the integration of RIE and PPL. In his tenure as VP of Distribution Operations for PPL, Bonenberger led the deployment of PPL's Smart Grid system (funded in part through an ARRA grant), which resulted in the biggest reliability improvement in company history. He also held the role of VP of Transmission and Substations through which he supported the PPL's grid modernization efforts. Bonenberger's utility experience spans nearly four decades. Bonenberger serves as Chair Emeritus of the Edison Electric Institute's National Response Executive Committee. He will allocate 50 hours to this project.

Al LaBarre – Vice President of Electric Operations, RIE

LaBarre will provide support, leadership, and guidance to this project, leveraging his nearly 30 years of experience in the electric industry. He will allocate 50 hours to this project.

Brian Schuster – Senior Director of External Affairs, RIE

Schuster will provide general support, leadership, and guidance to this project, especially regarding stakeholder, community, and labor engagement. Schuster leads the management of public relations and communications between RIE and the state's legislative, regulatory, and community stakeholders. His experience includes previous positions within external affairs, management, and engineering. He is also certified in Lean Six Sigma and Design Thinking, and a graduate of Leadership Rhode Island. These experiences lend themselves to both guidance and general team building, ensuring success and professional development for all members of the Project Team. He will allocate 100 hours to this project.

[20] "Getting Ready for a Renewable Energy Future." 2020. PPL Corporation. July 14, 2020. https://www.pplweb.com/blog/getting-ready-for-a-renewable-energy-future/#:~:text=PPL%20Electric%E2%80%99s%20Distributed%20Energy%20Resource%20Management%20System%20is

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(Previous Editions Obsolete)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. INSTRUCTIONS

The proposer shall prepare this Environmental Questionnaire (EQ) as accurately and completely as possible. Supporting information can be provided as attachments. The proposer must identify the location of the project and specifically describe the activities that would occur at that location. The proposer must provide specific information and quantities, regarding air emissions, wastewater discharges, solid wastes, etc., to facilitate the necessary review. In addition, the proposer must submit with this EQ a FINAL copy of the project's statement of work (SOW) or statement of project objective (SOPO) that will be used in the contract/agreement between the proposer and the U.S Department of Energy (DOE).

II. QUESTIONNAIRE

A. PROJECT SUMMARY

1. Solicitation/Project Number: DE-FOA-0002740 Proposer: TNEC d/b/a Rhode Island Energy
2. This Environmental Questionnaire pertains to a: ☒ Recipient or Prime Contractor ☐ Sub-recipient or Subcontractor
3. Principal Investigator: Bradford Labine Telephone Number: (b) (6)
4. Project Title: Smart Grid for Smart Decarbonization (TA-02: ADMS/AEMS/Digital Twin/Asset Hub)
5. Expected Project Duration: 5 Years
6. Location of Activities covered by **this** Environmental Questionnaire: (City/Township, County, State):
   State of Rhode Island
7. List the full scope of activities planned (only for the location that is the subject of this Environmental Questionnaire).
   Optimize our digital systems capabilities by integrating ADMS/AEMS to command and control the electric distribution/transmission systems, update the GIS system to create a digital representation of the electric grid with every asset and subcomponent, and develop an Asset and Data Hub that uses AI to enable data-driven automated decision-making.
8. List all other locations where work would be performed by the primary contractor of the project and subcontractor(s). Each of the following must have an individual Environmental Questionnaire.

Subcontractor or sub-recipient	Location of activities for this project

9. Identify and select the checkbox with the predominant project work activities under Group A, B, or C

Group A

☑ Routine administrative, procurement, training, and personnel actions. Contract activities/awards for management support, financial assistance, and technical services in support of agency business, programs, projects, and goals. Literature searches and information gathering, material inventories, property surveys; data analysis, computer modeling, analytical reviews, technical summary, conceptual design, feasibility studies, document preparation, data dissemination, and paper studies. Technical assistance including financial planning, assistance, classroom training, public meetings, management training, survey participation, academic contribution, technical consultation, and stakeholders surveys. Workshop and conference planning, preparation, and implementation which may involve promoting energy efficiency, renewable energy, and energy conservation.

STOP! ***If all work activities related to this project can be classified and described within categories under Group A, proceed directly to Section III CERTIFICATION BY PROPOSER. No additional information is required.***
If project work activities are described in either Group(s) B or C; then continue filling out questionnaire.

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Group B

☐ Laboratory Scale Research, Bench Scale Research, Pilot Scale Research, Proof-of-Concept Scale Research, or Field Test Research. Work DOES NOT involve new building/facilities construction and site excavation/groundbreaking activities. This work typically involves routine operation of existing laboratories, commercial buildings/properties, offices and homes, project test facilities, factories/power plants, vehicles test stands and components, refueling facilities, utility systems, or other existing structures/facilities. Work will NOT involve major change in facilities missions and operations, land use planning, new/modified regulatory/operating permit requirements. Includes work specific to routine DOE Site operations and Lab research work activities, but NOT building construction and site preparation. DOE work typically involves laboratory facilities and lab equipment operations, buildings and grounds management activities; and buildings and facilities maintenance, repairs, reconfiguration, remodeling, equipment use and replacement.

Group C

☐ Pilot Test Facilities Construction, Pilot Scale Research, Field Scale Demonstration, or Commercial Scale Application. Work typically involves facility construction, site preparation/excavation/groundbreaking, and/or demolition. This work would include construction, retrofit, replacement, and/or major modifications of laboratories, test facilities, energy system prototypes, and power generation infrastructure. Work may also involve construction and maintenance of utilities system right-of-ways, roads, vehicle test facilities, commercial buildings/properties, fuel refinery/mixing facilities, refueling facility, power plants, underground wells, and pipelines, and other types of energy research related facilities. This work may require new or modified regulatory permits, environmental sampling and monitoring requirements, master planning, public involvement, and environmental impact review. Includes work specific to DOE Site Operations and Lab operation activities involving building and facilities construction, replacement, decommissioning/demolition, site preparation, land use changes, or change in research facilities mission or operations.

B. PROPOSED PROJECT ALTERNATIVES

1. If applicable, list any project alternatives considered to achieve the project objectives.

C. PROJECT LOCATION

1. Provide a brief description of the project location (physical location, surrounding area, adjacent structures).

2. **Attach** a project site location map of the project work area.

D. ENVIRONMENTAL IMPACTS

NEPA procedures require evaluations of possible effects (including land use, energy resource use, natural, historic and cultural resources, and pollutants) from proposed projects on the environment.

1. Land Use

a. Characterize present land use where the proposed project would be located.

☐ Urban ☐ Industrial ☐ Commercial ☐ Agricultural
☐ Suburban ☐ Rural ☐ Residential ☐ Research Facilities
☐ Forest ☐ University Campus ☐ Other: _____

b. Identify the total size of the facility, structure, or system and what portion would be used for the proposed project.

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c. Describe planned construction, installation, and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, laboratories, storage tanks, fueling facilities, underground wells, pipelines, or other structures.
☐ No construction would be anticipated for this project.

d. Describe how land use would be affected by operational activities associated with the proposed project.
☐ No land areas would be affected.

e. Describe any plans to reclaim areas that would be affected by the proposed project.
☐ No land areas would be affected.

f. Would the proposed project affect any unique or unusual landforms (e.g., cliffs, waterfalls, etc.)?
☐ No ☐ Yes (describe)

g. Would the proposed project be located in or near local, state, or federal parks; forests; monuments; scenic waterways; wilderness; recreation facilities; or tribal lands? ☐ No ☐ Yes (describe)

2. Construction Activities and/or Operation

a. Identify project structure(s), power line(s), pipeline(s), utilities system(s), right-of-way(s) or road(s) that will be constructed and clearly mark them on a project site map or topographic map as appropriate. ☐ None

b. Would the proposed project require the construction of waste pits or settling ponds?
☐ No ☐ Yes (describe and identify location, and estimate surface area disturbed)

c. Would the proposed project affect any existing body of water? ☐ No ☐ Yes (describe)

d. Would the proposed project impact a floodplain or wetland? ☐ No ☐ Yes (describe)

e. Would the proposed project potentially cause runoff/sedimentation/erosion? ☐ No ☐ Yes (describe)

f. Would the proposed project include activities located on perma-frost, near fault zones, or involve fracturing, well drilling, geologic stimulation, sequestration, active seismic data collection, and/or deepwater operations?
☐ No ☐ Yes (describe)

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g. Would the proposed project involve any of the following: nanotechnology; recombinant DNA or genetic engineering; facility decommissioning or disposition of equipment/materials; or management of radioactive wastes/materials?
☐ No ☐ Yes (describe)

3. Biological Resources

a. Identify any State or Federally listed endangered or threatened plant or animal species potentially affected by the proposed project.
☐ None

b. Would any designated critical habitat be affected by the proposed project? ☐ No ☐ Yes (describe)

c. Describe any impacts that construction would have on any other types of sensitive or unique habitats.
☐ No planned construction ☐ No habitats ☐ None ☐ Impact (describe)

d. Would any foreign substances/materials be introduced into ground or surface waters, soil, or other earth/geologic resource because of project activities? How would these foreign substances/materials affect the water, soil, biota, and geologic resources? ☐ No ☐ Yes (describe)

e. Would any migratory animal corridors be impacted or disrupted by the proposed project? ☐ No ☐ Yes (describe)

4. Socioeconomic and Infrastructure Conditions

a. Would local socio-economic changes result from the proposed project? ☐ No ☐ Yes (describe)

b. Would the proposed project generate increased traffic use of roads through local neighborhoods, urban or rural areas?
☐ No ☐ Yes (describe)

c. Would the proposed project require new transportation access (roads, rail, etc.)? Describe location, impacts, costs.
☐ No ☐ Yes (describe)

d. Would the proposed project create a significant increase in local energy usage? ☐ No ☐ Yes (describe)

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5. Historical/Cultural Resources

a. Describe any historical, archaeological, or cultural sites in the vicinity of the proposed project; note any sites included on the National Register of Historic Places. ☐ None

b. Would construction or operational activities planned under the proposed project disturb any historical, archaeological, or cultural sites? ☐ No planned construction ☐ No historic sites ☐ Yes (describe) ☐ No Impact (discuss)

c. Has the State Historic Preservation Office been contacted with regard to this project? ☐ No ☐ Yes (describe)

d. Would the proposed project interfere with visual resources (e.g., eliminate scenic views) or alter the present landscape?
☐ No ☐ Yes (describe)

e. Would the proposed project be located on or adjacent to tribal lands, lands considered to be sacred, or lands used for traditional purposes? Describe any known tribal sensitivities for the proposed project area.

6. Atmospheric Conditions/Air Quality

a. Identify air quality conditions in the immediate vicinity of the proposed project with regard to attainment of National Ambient Air Quality Standards (NAAQS). This information is available under the Green Book Non-Attainment Areas for Criteria Pollutants located at http://www.epa.gov/air/oaqps/greenbk/astate.html

	Attainment	Non-Attainment
O_3 - 1 Hour	☐	☐
O_3 - 8 Hour	☐	☐
SO_x	☐	☐
PM - 2.5	☐	☐
PM - 10	☐	☐
CO	☐	☐
NO_2	☐	☐
Lead	☐	☐

b. Would proposed project require issuance of new or modified local, state, or federal air permits to perform project related work and activities? ☐ No ☐ Yes (describe)

c. Would the proposed project be in compliance with local and state air quality requirements? ☐ Yes
If not, please explain.

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d. Would the proposed project be classified as either a New Source or a major modification to an existing source?
☐ No ☐ Yes (describe)

e. What types of air emissions, including fugitive emissions, would be anticipated from the proposed project, and what would be the maximum annual rate of emissions for the project?

	Maximum per Year	Total for Project
☐ SO_x		
☐ NO_x		
☐ PM - 2.5		
☐ PM - 10		
☐ CO		
☐ CO_2		
☐ Lead		
☐ H_2S		
☐ Organic solvent vapors or other volatile organic compounds--List:		
☐ Hazardous air pollutants -- List:		
☐ Other -- List:		
☐ None		

f. Would any types of emission control or particulate collection devices be used?
☐ No ☐ Yes (describe, including collection efficiencies)

g. How would emissions be vented?

7. Hydrologic Conditions/Water Quality

a. What nearby water bodies may be affected by the proposed project? Provide distance(s) from the project site.

b. What sources would supply potable and process water for the proposed project?

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c. Quantify the wastewater that would be generated by the proposed project.

	Gallons/day	Gallons/year
☐ Non-contact cooling water		
☐ Process water		
☐ Sanitary		
☐ Other -- describe:		
☐ None		

d. What would be the major components of each type of wastewater (e.g., coal fines)? ☐ No wastewater produced

e. Identify the local treatment facility that would receive wastewater from the proposed project.
☐ No discharges to local treatment facility

f. Describe how wastewater would be collected and treated. ☐ No wastewater produced

g. Would any run-off or leachates be produced from storage piles or waste disposal sites? ☐ No ☐ Yes (describe source)

h. Would project require issuance of new or modified water permits to perform project work or site development activities?
☐ No ☐ Yes (describe)

i. Where would wastewater effluents from the proposed project be discharged? ☐ No wastewater produced

j. Would the proposed project be permitted to discharge effluents into an existing body of water?
☐ No ☐ Yes (describe water use and effluent impact)

k. Would a new or modified National Pollutant Discharge Elimination System (NPDES) permit be required?
☐ No ☐ Yes (describe)

l. Would the proposed project adversely affect the quality or movement of groundwater? ☐ No ☐ Yes (describe)

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m. Would the proposed project require issuance of an Underground Injection Control (UIC) permit?
☐ No ☐ Yes (describe)

n. Would the proposed project be located in or near a wellhead protection area, drinking water protection area, or above a sole source aquifer or underground source of drinking water (USDW)?
☐ No ☐ Yes (describe)

8. Solid and Hazardous Wastes

a. Identify and estimate wastes that would be generated from the project. Solid wastes are defined as any solid, liquid, semi-solid, or contained gaseous material that is discarded, has served its intended purpose, or is a manufacturing or mining by-product (See EPA Municipal Solid Waste and Municipal Solid Waste by State).

	Annual Quantity
☐ **Municipal solid waste (e.g., paper, plastic, etc.)**	
☐ **Coal or coal by-products**	
☐ **Other -- Identify:**	
☐ **Hazardous waste – Identify:**	
☐ **None**	

b. Would project require issuance of new or modified solid waste and/or hazardous waste related permits to perform project work activities? ☐ No ☐ Yes (explain)

c. How and where would solid waste disposal be accomplished?
☐ None generated
☐ On-site (identify and describe location)
☐ Off-site (identify location and describe facility and treatment)

d. How would wastes for disposal be transported?

e. Describe hazardous wastes that would be generated, treated, handled, or stored under this project. Hazardous waste information can be found at EPA Hazardous Waste website. ☐ None

f. How would hazardous or toxic waste be collected and stored? ☐ None used or produced

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g. If hazardous wastes would require off-site disposal, have arrangements been made with a certified TSD (Treatment, Storage, and Disposal) facility?

☐ Not required ☐ Arrangements not yet made ☐ Arrangements made with a certified TSD facility (identify)

9. Health/Safety Factors

a. Identify hazardous or toxic materials that would be used in the proposed project.

☐ None ☐ Hazardous or toxic materials that would be used (identify):

b. Describe the potential impacts of this project's hazardous materials on human health and the environment.

☐ None

c. Would there be any special physical hazards or health risks associated with the project? ☐ No ☐ Yes (describe)

d. Does a worker safety program exist at the location of the proposed project? ☐ No ☐ Yes (describe)

e. Would additional safety training be necessary for any new laboratory, equipment, or processes involved with the project?

☐ No ☐ Yes (describe)

f. Describe any increases in ambient noise levels to the public from construction and operational activities.

☐ None ☐ Increase in ambient noise level (describe)

g. Would project construction result in the removal of natural or other barriers that act as noise screens?

☐ No construction planned ☐ No ☐ Yes (describe)

h. Would hearing protection be required for workers? ☐ No ☐ Yes (describe)

10. Environmental Restoration and/or Waste Management

a. Would the proposed project include CERCLA removals or similar actions under RCRA or other authorities?

☐ No ☐ Yes (describe)

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b. Would the proposed project include siting, construction, and operation of temporary pilot-scale waste collection and treatment facilities or pilot-scale waste stabilization and containment facilities? ☐ No ☐ Yes (describe)

c. Would the proposed project involve operations of environmental monitoring and control systems?
☐ No ☐ Yes (describe)

d. Would the proposed project involve siting, construction, operation, or decommissioning of a facility for storing packaged hazardous waste for 90 days or less? ☐ No ☐ Yes (describe)

E. REGULATORY COMPLIANCE

1. For the following laws, describe any existing permits, new or modified permits, manifests, responsible authorities or agencies, contacts, etc., that would be required for the proposed project

a. Resource Conservation and Recovery Act (RCRA): ☐ None ☐ New Required ☐ Modification Required
Describe:

b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):
☐ None ☐ New Required ☐ Modification Required
Describe:

c. Toxic Substance Control Act (TSCA): ☐ None ☐ New Required ☐ Modification Required
Describe:

d. Clean Water Act (CWA): ☐ None ☐ New Required ☐ Modification Required
Describe:

e. Underground Storage Tank Control Program (UST): ☐ None ☐ New Required ☐ Modification Required
Describe:

f. Underground Injection Control Program (UIC): ☐ None ☐ New Required ☐ Modification Required
Describe:

g. Clean Air Act (CAA): ☐ None ☐ New Required ☐ Modification Required
Describe:

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h. Endangered Species Act (ESA): ☐ None ☐ New Required ☐ Modification Required
Describe:

i. Floodplains and Wetlands Regulations: ☐ None ☐ New Required ☐ Modification Required
Describe:

j. Fish and Wildlife Coordination Act (FWCA): ☐ None ☐ New Required ☐ Modification Required
Describe:

k. National Historic Preservation Act (NHPA): ☐ None ☐ New Required ☐ Modification Required
Describe:

l. Coastal Zone Management Act (CZMA): ☐ None ☐ New Required ☐ Modification Required
Describe:

2. Identify any other environmental laws and regulations (Federal, state, and local) for which compliance would be necessary for this project, and describe the permits, manifests, and contacts that would be required.

F. DESCRIBE ANY ISSUES THAT WOULD GENERATE PUBLIC CONTROVERSY REGARDING THE PROPOSED PROJECT. ☐ None

G. WOULD THE PROPOSED PROJECT PRODUCE ADDITIONAL DEVELOPMENT, OR ARE OTHER MAJOR DEVELOPMENTS PLANNED OR UNDERWAY, IN THE PROJECT AREA?

☐ No ☐ Yes (describe)

H. SUMMARIZE THE SIGNIFICANT IMPACTS THAT WOULD RESULT FROM THE PROPOSED PROJECT.

☐ None (provide supporting detail) ☐ Significant impacts (describe)

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I. PROVIDE A DESCRIPTION OF HOW THE PROJECT WOULD BE DECOMMISSIONED, INCLUDING THE DISPOSITION OF EQUIPMENT AND MATERIALS.

III. CERTIFICATION BY PROPOSER

I hereby certify that the information provided herein is current, accurate, and complete as of the date shown immediately below.

Signature: Kathy Castro Digitally signed by Kathy Castro Date: 2023.03.14 09:11:49 -04'00'

Date (mm/dd/yyyy): 03/14/2023

Typed Name: Kathy Castro

Title: Director of Asset Management and Planning

Organization: Rhode Island Energy

IV. REVIEW AND APPROVAL BY DOE

I hereby certify that I have reviewed the information provided in this questionnaire, have determined that all questions have been appropriately answered, and judge the responses to be consistent with the efforts proposed.

DOE Project Manager

Signature:

Date (mm/dd/yyyy):

Typed Name:

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Reviewed: 12/3/2014
(Previous Editions Obsolete)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

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II. QUESTIONNAIRE

A. PROJECT SUMMARY

1. Solicitation/Project Number: DE-FOA-0002740 Proposer: TNEC d/b/a/ Rhode Island Energy
2. This Environmental Questionnaire pertains to a: ☒ Recipient or Prime Contractor ☐ Sub-recipient or Subcontractor
3. Principal Investigator: Bradford Labine Telephone Number: (b) (6)
4. Project Title: Smart Grid for Smart Decarbonization (TA-02: Advanced Reclosers)
5. Expected Project Duration: 5 Years
6. Location of Activities covered by **this** Environmental Questionnaire: (City/Township, County, State):
   State of Rhode Island
7. List the full scope of activities planned (only for the location that is the subject of this Environmental Questionnaire).
   Installation of 1,561 Advanced Reclosers on existing single-phase taps throughout the state.
8. List all other locations where work would be performed by the primary contractor of the project and subcontractor(s). Each of the following must have an individual Environmental Questionnaire.

Subcontractor or sub-recipient	Location of activities for this project

9. Identify and select the checkbox with the predominant project work activities under Group A, B, or C

Group A

☐ Routine administrative, procurement, training, and personnel actions. Contract activities/awards for management support, financial assistance, and technical services in support of agency business, programs, projects, and goals. Literature searches and information gathering, material inventories, property surveys; data analysis, computer modeling, analytical reviews, technical summary, conceptual design, feasibility studies, document preparation, data dissemination, and paper studies. Technical assistance including financial planning, assistance, classroom training, public meetings, management training, survey participation, academic contribution, technical consultation, and stakeholders surveys. Workshop and conference planning, preparation, and implementation which may involve promoting energy efficiency, renewable energy, and energy conservation.

STOP! ***If all work activities related to this project can be classified and described within categories under Group A, proceed directly to Section III CERTIFICATION BY PROPOSER. No additional information is required.***
If project work activities are described in either Group(s) B or C; then continue filling out questionnaire.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

Group B

☐ Laboratory Scale Research, Bench Scale Research, Pilot Scale Research, Proof-of-Concept Scale Research, or Field Test Research. Work DOES NOT involve new building/facilities construction and site excavation/groundbreaking activities. This work typically involves routine operation of existing laboratories, commercial buildings/properties, offices and homes, project test facilities, factories/power plants, vehicles test stands and components, refueling facilities, utility systems, or other existing structures/facilities. Work will NOT involve major change in facilities missions and operations, land use planning, new/modified regulatory/operating permit requirements. Includes work specific to routine DOE Site operations and Lab research work activities, but NOT building construction and site preparation. DOE work typically involves laboratory facilities and lab equipment operations, buildings and grounds management activities; and buildings and facilities maintenance, repairs, reconfiguration, remodeling, equipment use and replacement.

Group C

☑ Pilot Test Facilities Construction, Pilot Scale Research, Field Scale Demonstration, or Commercial Scale Application. Work typically involves facility construction, site preparation/excavation/groundbreaking, and/or demolition. This work would include construction, retrofit, replacement, and/or major modifications of laboratories, test facilities, energy system prototypes, and power generation infrastructure. Work may also involve construction and maintenance of utilities system right-of-ways, roads, vehicle test facilities, commercial buildings/properties, fuel refinery/mixing facilities, refueling facility, power plants, underground wells, and pipelines, and other types of energy research related facilities. This work may require new or modified regulatory permits, environmental sampling and monitoring requirements, master planning, public involvement, and environmental impact review. Includes work specific to DOE Site Operations and Lab operation activities involving building and facilities construction, replacement, decommissioning/demolition, site preparation, land use changes, or change in research facilities mission or operations.

B. PROPOSED PROJECT ALTERNATIVES

1. If applicable, list any project alternatives considered to achieve the project objectives.

No feasible alternatives that will achieve the project objectives.

C. PROJECT LOCATION

1. Provide a brief description of the project location (physical location, surrounding area, adjacent structures).

TNEC's service area in the State of Rhode Island: 1076 square miles.

2. **Attach** a project site location map of the project work area.

N/A

D. ENVIRONMENTAL IMPACTS

NEPA procedures require evaluations of possible effects (including land use, energy resource use, natural, historic and cultural resources, and pollutants) from proposed projects on the environment.

1. Land Use

a. Characterize present land use where the proposed project would be located.

☑ Urban	☑ Industrial	☑ Commercial	☐ Agricultural
☑ Suburban	☑ Rural	☑ Residential	☐ Research Facilities
☐ Forest	☐ University Campus	☐ Other: _____	

b. Identify the total size of the facility, structure, or system and what portion would be used for the proposed project.

Installation of 1,561 Advanced Reclosers on existing single-phase taps throughout the state.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

c. Describe planned construction, installation, and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, laboratories, storage tanks, fueling facilities, underground wells, pipelines, or other structures.

☐ No construction would be anticipated for this project.

Reclosers will be installed at existing locations. Select poles will be replaced to provide increased elevation, as necessary.

d. Describe how land use would be affected by operational activities associated with the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

e. Describe any plans to reclaim areas that would be affected by the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

f. Would the proposed project affect any unique or unusual landforms (e.g., cliffs, waterfalls, etc.)?

☑ No ☐ Yes (describe)

g. Would the proposed project be located in or near local, state, or federal parks; forests; monuments; scenic waterways; wilderness; recreation facilities; or tribal lands? ☐ No ☑ Yes (describe)

The infrastructure upon which the reclosers are to be installed may be located in or near areas as categorized above, but no adverse effects are anticipated.

2. Construction Activities and/or Operation

a. Identify project structure(s), power line(s), pipeline(s), utilities system(s), right-of-way(s) or road(s) that will be constructed and clearly mark them on a project site map or topographic map as appropriate. ☐ None

Reclosers will be installed on existing infrastructure.

b. Would the proposed project require the construction of waste pits or settling ponds?

☑ No ☐ Yes (describe and identify location, and estimate surface area disturbed)

c. Would the proposed project affect any existing body of water? ☑ No ☐ Yes (describe)

d. Would the proposed project impact a floodplain or wetland? ☐ No ☑ Yes (describe)

During design, internal environmental reviews would identify potential impacts to flood plains or wetlands and take measures to ensure compliance with local/state/federal laws.

e. Would the proposed project potentially cause runoff/sedimentation/erosion? ☐ No ☑ Yes (describe)

During design, internal environmental reviews would identify required measures for avoidance/management of these issues to ensure compliance with local/state/federal laws.

f. Would the proposed project include activities located on perma-frost, near fault zones, or involve fracturing, well drilling, geologic stimulation, sequestration, active seismic data collection, and/or deepwater operations?

☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

g. Would the proposed project involve any of the following: nanotechnology; recombinant DNA or genetic engineering; facility decommissioning or disposition of equipment/materials; or management of radioactive wastes/materials?
☑ No ☐ Yes (describe)

3. Biological Resources

a. Identify any State or Federally listed endangered or threatened plant or animal species potentially affected by the proposed project.
☑ None

During design, internal environmental reviews will identify potentially affected state/federally listed endangered/threatened species to be avoided or mitigated.

b. Would any designated critical habitat be affected by the proposed project? ☐ No ☑ Yes (describe)

During design, internal environmental reviews will identify critical habitats to be avoided or provide measures to mitigate impacts if unavoidable.

c. Describe any impacts that construction would have on any other types of sensitive or unique habitats.
☑ No planned construction ☐ No habitats ☐ None ☐ Impact (describe)

d. Would any foreign substances/materials be introduced into ground or surface waters, soil, or other earth/geologic resource because of project activities? How would these foreign substances/materials affect the water, soil, biota, and geologic resources? ☑ No ☐ Yes (describe)

e. Would any migratory animal corridors be impacted or disrupted by the proposed project? ☑ No ☐ Yes (describe)

4. Socioeconomic and Infrastructure Conditions

a. Would local socio-economic changes result from the proposed project? ☑ No ☐ Yes (describe)

b. Would the proposed project generate increased traffic use of roads through local neighborhoods, urban or rural areas?
☑ No ☐ Yes (describe)

c. Would the proposed project require new transportation access (roads, rail, etc.)? Describe location, impacts, costs.
☑ No ☐ Yes (describe)

d. Would the proposed project create a significant increase in local energy usage? ☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

5. Historical/Cultural Resources

a. Describe any historical, archaeological, or cultural sites in the vicinity of the proposed project; note any sites included on the National Register of Historic Places. ☑ None

b. Would construction or operational activities planned under the proposed project disturb any historical, archaeological, or cultural sites? ☐ No planned construction ☑ No historic sites ☐ Yes (describe) ☐ No Impact (discuss)

c. Has the State Historic Preservation Office been contacted with regard to this project? ☑ No ☐ Yes (describe)

Not applicable.

d. Would the proposed project interfere with visual resources (e.g., eliminate scenic views) or alter the present landscape?
☑ No ☐ Yes (describe)

e. Would the proposed project be located on or adjacent to tribal lands, lands considered to be sacred, or lands used for traditional purposes? Describe any known tribal sensitivities for the proposed project area.

Reclosers will be installed on existing infrastructure, which may be on or adjacent to, but have no adverse impact on, such locations.

6. Atmospheric Conditions/Air Quality

a. Identify air quality conditions in the immediate vicinity of the proposed project with regard to attainment of National Ambient Air Quality Standards (NAAQS). This information is available under the Green Book Non-Attainment Areas for Criteria Pollutants located at http://www.epa.gov/air/oaqps/greenbk/astate.html

	Attainment	Non-Attainment
O_3 - 1 Hour	☑	☐
O_3 - 8 Hour	☑	☐
SO_x	☑	☐
PM - 2.5	☑	☐
PM - 10	☑	☐
CO	☑	☐
NO_2	☑	☐
Lead	☑	☐

b. Would proposed project require issuance of new or modified local, state, or federal air permits to perform project related work and activities? ☑ No ☐ Yes (describe)

c. Would the proposed project be in compliance with local and state air quality requirements? ☑ Yes
If not, please explain.

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ENVIRONMENTAL QUESTIONNAIRE

d. Would the proposed project be classified as either a New Source or a major modification to an existing source?
☑ No ☐ Yes (describe)

e. What types of air emissions, including fugitive emissions, would be anticipated from the proposed project, and what would be the maximum annual rate of emissions for the project?

	Maximum per Year	Total for Project
☐ SO_x		
☐ NO_x		
☐ PM - 2.5		
☐ PM - 10		
☐ CO		
☐ CO_2		
☐ Lead		
☐ H_2S		
☐ Organic solvent vapors or other volatile organic compounds--List:		
☐ Hazardous air pollutants -- List:		
☐ Other -- List:		
☑ None		

f. Would any types of emission control or particulate collection devices be used?
☑ No ☐ Yes (describe, including collection efficiencies)

g. How would emissions be vented?

Not applicable.

7. Hydrologic Conditions/Water Quality

a. What nearby water bodies may be affected by the proposed project? Provide distance(s) from the project site.

No bodies of water are anticipated to be affected by the proposed project, however, this would be confirmed during design by an internal environmental review.

b. What sources would supply potable and process water for the proposed project?

Not applicable.

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ENVIRONMENTAL QUESTIONNAIRE

c. Quantify the wastewater that would be generated by the proposed project.

	Gallons/day	Gallons/year
☐ Non-contact cooling water		
☐ Process water		
☐ Sanitary		
☐ Other -- describe:		
☑ None		

d. What would be the major components of each type of wastewater (e.g., coal fines)? ☑ No wastewater produced

e. Identify the local treatment facility that would receive wastewater from the proposed project.
☑ No discharges to local treatment facility

f. Describe how wastewater would be collected and treated. ☑ No wastewater produced

g. Would any run-off or leachates be produced from storage piles or waste disposal sites? ☑ No ☐ Yes (describe source)

h. Would project require issuance of new or modified water permits to perform project work or site development activities?
☑ No ☐ Yes (describe)

i. Where would wastewater effluents from the proposed project be discharged? ☑ No wastewater produced

j. Would the proposed project be permitted to discharge effluents into an existing body of water?
☑ No ☐ Yes (describe water use and effluent impact)

k. Would a new or modified National Pollutant Discharge Elimination System (NPDES) permit be required?
☑ No ☐ Yes (describe)

l. Would the proposed project adversely affect the quality or movement of groundwater? ☑ No ☐ Yes (describe)

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ENVIRONMENTAL QUESTIONNAIRE

m. Would the proposed project require issuance of an Underground Injection Control (UIC) permit?

☑ No ☐ Yes (describe)

n. Would the proposed project be located in or near a wellhead protection area, drinking water protection area, or above a sole source aquifer or underground source of drinking water (USDW)?

☑ No ☐ Yes (describe)

During design, internal environmental reviews would identify such areas, however, the project is not expected to introduce new risks to existing above/below ground sources.

8. Solid and Hazardous Wastes

a. Identify and estimate wastes that would be generated from the project. Solid wastes are defined as any solid, liquid, semi-solid, or contained gaseous material that is discarded, has served its intended purpose, or is a manufacturing or mining by-product (See EPA Municipal Solid Waste and Municipal Solid Waste by State).

	Annual Quantity
☐ **Municipal solid waste (e.g., paper, plastic, etc.)**	
☐ **Coal or coal by-products**	
☑ **Other -- Identify:** Replaced poles/hardware.	Indeterminate
☐ **Hazardous waste – Identify:**	
☐ **None**	

b. Would project require issuance of new or modified solid waste and/or hazardous waste related permits to perform project work activities? ☑ No ☐ Yes (explain)

c. How and where would solid waste disposal be accomplished?

☐ None generated
☐ On-site (identify and describe location)
☑ Off-site (identify location and describe facility and treatment)

Replaced poles will be returned to our facility for disposal at a licensed disposal facility and/or chipped for use as boiler fuel. Hardware will be recycled or similarly disposed of.

d. How would wastes for disposal be transported?

Utility truck.

e. Describe hazardous wastes that would be generated, treated, handled, or stored under this project. Hazardous waste information can be found at EPA Hazardous Waste website. ☑ None

f. How would hazardous or toxic waste be collected and stored? ☑ None used or produced

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

g. If hazardous wastes would require off-site disposal, have arrangements been made with a certified TSD (Treatment, Storage, and Disposal) facility?

☑ Not required ☐ Arrangements not yet made ☐ Arrangements made with a certified TSD facility (identify)

9. Health/Safety Factors

a. Identify hazardous or toxic materials that would be used in the proposed project.

☑ None ☐ Hazardous or toxic materials that would be used (identify):

b. Describe the potential impacts of this project's hazardous materials on human health and the environment.

☑ None

c. Would there be any special physical hazards or health risks associated with the project? ☑ No ☐ Yes (describe)

d. Does a worker safety program exist at the location of the proposed project? ☐ No ☑ Yes (describe)

Current Health & Safety policies and procedures will be implemented during all phases of the proposed project.

e. Would additional safety training be necessary for any new laboratory, equipment, or processes involved with the project?

☑ No ☐ Yes (describe)

f. Describe any increases in ambient noise levels to the public from construction and operational activities.

☐ None ☑ Increase in ambient noise level (describe)

Limited increase in ambient noise levels would occur if pole replacement is required.

g. Would project construction result in the removal of natural or other barriers that act as noise screens?

☑ No construction planned ☐ No ☐ Yes (describe)

h. Would hearing protection be required for workers? ☐ No ☑ Yes (describe)

If needed, as dictated by current Health & Safety policies and procedures.

10. Environmental Restoration and/or Waste Management

a. Would the proposed project include CERCLA removals or similar actions under RCRA or other authorities?

☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

b. Would the proposed project include siting, construction, and operation of temporary pilot-scale waste collection and treatment facilities or pilot-scale waste stabilization and containment facilities? ☑ No ☐ Yes (describe)

c. Would the proposed project involve operations of environmental monitoring and control systems?
☑ No ☐ Yes (describe)

d. Would the proposed project involve siting, construction, operation, or decommissioning of a facility for storing packaged hazardous waste for 90 days or less? ☑ No ☐ Yes (describe)

E. REGULATORY COMPLIANCE

1. For the following laws, describe any existing permits, new or modified permits, manifests, responsible authorities or agencies, contacts, etc., that would be required for the proposed project

a. Resource Conservation and Recovery Act (RCRA): ☑ None ☐ New Required ☐ Modification Required
Describe:

b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):
☑ None ☐ New Required ☐ Modification Required
Describe:

c. Toxic Substance Control Act (TSCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

d. Clean Water Act (CWA): ☑ None ☐ New Required ☐ Modification Required
Describe:

e. Underground Storage Tank Control Program (UST): ☑ None ☐ New Required ☐ Modification Required
Describe:

f. Underground Injection Control Program (UIC): ☑ None ☐ New Required ☐ Modification Required
Describe:

g. Clean Air Act (CAA): ☑ None ☐ New Required ☐ Modification Required
Describe:

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

h. Endangered Species Act (ESA): ☑ None ☐ New Required ☐ Modification Required
Describe:

i. Floodplains and Wetlands Regulations: ☑ None ☐ New Required ☐ Modification Required
Describe:

j. Fish and Wildlife Coordination Act (FWCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

k. National Historic Preservation Act (NHPA): ☑ None ☐ New Required ☐ Modification Required
Describe:

l. Coastal Zone Management Act (CZMA): ☑ None ☐ New Required ☐ Modification Required
Describe:

2. Identify any other environmental laws and regulations (Federal, state, and local) for which compliance would be necessary for this project, and describe the permits, manifests, and contacts that would be required.

None. All work will be performed under existing exemptions.

F. DESCRIBE ANY ISSUES THAT WOULD GENERATE PUBLIC CONTROVERSY REGARDING THE PROPOSED PROJECT. ☑ None

G. WOULD THE PROPOSED PROJECT PRODUCE ADDITIONAL DEVELOPMENT, OR ARE OTHER MAJOR DEVELOPMENTS PLANNED OR UNDERWAY, IN THE PROJECT AREA?

☑ No ☐ Yes (describe)

H. SUMMARIZE THE SIGNIFICANT IMPACTS THAT WOULD RESULT FROM THE PROPOSED PROJECT.

☑ None (provide supporting detail) ☐ Significant impacts (describe)

There are no significant impacts anticipated as a result of this project.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. PROVIDE A DESCRIPTION OF HOW THE PROJECT WOULD BE DECOMMISSIONED, INCLUDING THE DISPOSITION OF EQUIPMENT AND MATERIALS.

Upon decommissioning, hardware and utility poles would be returned to our facility in Providence, Rhode Island for re-use, recycling, or disposal at a licensed solid waste facility.

III. CERTIFICATION BY PROPOSER

I hereby certify that the information provided herein is current, accurate, and complete as of the date shown immediately below.

Signature: Kathy Castro Digitally signed by Kathy Castro Date: 2023.03.14 09:12:54 -04'00'

Date (mm/dd/yyyy): 03/14/2023

Typed Name: Kathy Castro

Title: Director of Asset Management and Planning

Organization: Rhode Island Energy

IV. REVIEW AND APPROVAL BY DOE

I hereby certify that I have reviewed the information provided in this questionnaire, have determined that all questions have been appropriately answered, and judge the responses to be consistent with the efforts proposed.

DOE Project Manager

Signature:

Date (mm/dd/yyyy):

Typed Name:

NETL F 451.1-1/3
Revised: 12/3/2014
Reviewed: 12/3/2014
(Previous Editions Obsolete)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. INSTRUCTIONS

The proposer shall prepare this Environmental Questionnaire (EQ) as accurately and completely as possible. Supporting information can be provided as attachments. The proposer must identify the location of the project and specifically describe the activities that would occur at that location. The proposer must provide specific information and quantities, regarding air emissions, wastewater discharges, solid wastes, etc., to facilitate the necessary review. In addition, the proposer must submit with this EQ a FINAL copy of the project's statement of work (SOW) or statement of project objective (SOPO) that will be used in the contract/agreement between the proposer and the U.S Department of Energy (DOE).

II. QUESTIONNAIRE

A. PROJECT SUMMARY

1. Solicitation/Project Number: DE-FOA-0002740 Proposer: TNEC d/b/a/ Rhode Island Energy
2. This Environmental Questionnaire pertains to a: ☒ Recipient or Prime Contractor ☐ Sub-recipient or Subcontractor
3. Principal Investigator: Bradford Labine Telephone Number: (b) (6)
4. Project Title: Smart Grid for Smart Decarbonization (TA-02: Smart Digital Relays)
5. Expected Project Duration: 5 Years
6. Location of Activities covered by **this** Environmental Questionnaire: (City/Township, County, State):
   State of Rhode Island
7. List the full scope of activities planned (only for the location that is the subject of this Environmental Questionnaire).
   Replace 170 electromechanical relays in existing substations throughout the state with Smart, communication-ready, Digital Relays. The additional smart functionality includes providing data points to the Asset Hub, including fault location identification.
8. List all other locations where work would be performed by the primary contractor of the project and subcontractor(s). Each of the following must have an individual Environmental Questionnaire.

Subcontractor or sub-recipient	Location of activities for this project

9. Identify and select the checkbox with the predominant project work activities under Group A, B, or C

Group A

☐ Routine administrative, procurement, training, and personnel actions. Contract activities/awards for management support, financial assistance, and technical services in support of agency business, programs, projects, and goals. Literature searches and information gathering, material inventories, property surveys; data analysis, computer modeling, analytical reviews, technical summary, conceptual design, feasibility studies, document preparation, data dissemination, and paper studies. Technical assistance including financial planning, assistance, classroom training, public meetings, management training, survey participation, academic contribution, technical consultation, and stakeholders surveys. Workshop and conference planning, preparation, and implementation which may involve promoting energy efficiency, renewable energy, and energy conservation.

STOP! ***If all work activities related to this project can be classified and described within categories under Group A, proceed directly to Section III CERTIFICATION BY PROPOSER. No additional information is required.***
If project work activities are described in either Group(s) B or C; then continue filling out questionnaire.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

Group B

☐ Laboratory Scale Research, Bench Scale Research, Pilot Scale Research, Proof-of-Concept Scale Research, or Field Test Research. Work DOES NOT involve new building/facilities construction and site excavation/groundbreaking activities. This work typically involves routine operation of existing laboratories, commercial buildings/properties, offices and homes, project test facilities, factories/power plants, vehicles test stands and components, refueling facilities, utility systems, or other existing structures/facilities. Work will NOT involve major change in facilities missions and operations, land use planning, new/modified regulatory/operating permit requirements. Includes work specific to routine DOE Site operations and Lab research work activities, but NOT building construction and site preparation. DOE work typically involves laboratory facilities and lab equipment operations, buildings and grounds management activities; and buildings and facilities maintenance, repairs, reconfiguration, remodeling, equipment use and replacement.

Group C

☑ Pilot Test Facilities Construction, Pilot Scale Research, Field Scale Demonstration, or Commercial Scale Application. Work typically involves facility construction, site preparation/excavation/groundbreaking, and/or demolition. This work would include construction, retrofit, replacement, and/or major modifications of laboratories, test facilities, energy system prototypes, and power generation infrastructure. Work may also involve construction and maintenance of utilities system right-of-ways, roads, vehicle test facilities, commercial buildings/properties, fuel refinery/mixing facilities, refueling facility, power plants, underground wells, and pipelines, and other types of energy research related facilities. This work may require new or modified regulatory permits, environmental sampling and monitoring requirements, master planning, public involvement, and environmental impact review. Includes work specific to DOE Site Operations and Lab operation activities involving building and facilities construction, replacement, decommissioning/demolition, site preparation, land use changes, or change in research facilities mission or operations.

B. PROPOSED PROJECT ALTERNATIVES

1. If applicable, list any project alternatives considered to achieve the project objectives.

No feasible alternatives that will achieve the project objectives.

C. PROJECT LOCATION

1. Provide a brief description of the project location (physical location, surrounding area, adjacent structures).

TNEC's service area in the State of Rhode Island: 1076 square miles.

2. **Attach** a project site location map of the project work area.

N/A

D. ENVIRONMENTAL IMPACTS

NEPA procedures require evaluations of possible effects (including land use, energy resource use, natural, historic and cultural resources, and pollutants) from proposed projects on the environment.

1. Land Use

a. Characterize present land use where the proposed project would be located.

☑ Urban	☑ Industrial	☑ Commercial	☐ Agricultural
☑ Suburban	☑ Rural	☑ Residential	☐ Research Facilities
☐ Forest	☐ University Campus	☐ Other: _____	

b. Identify the total size of the facility, structure, or system and what portion would be used for the proposed project.

Replace 170 relays in existing substations throughout the state.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

c. Describe planned construction, installation, and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, laboratories, storage tanks, fueling facilities, underground wells, pipelines, or other structures.

☐ No construction would be anticipated for this project.

Relays will be installed within existing substations.

d. Describe how land use would be affected by operational activities associated with the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

e. Describe any plans to reclaim areas that would be affected by the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

f. Would the proposed project affect any unique or unusual landforms (e.g., cliffs, waterfalls, etc.)?

☑ No ☐ Yes (describe)

g. Would the proposed project be located in or near local, state, or federal parks; forests; monuments; scenic waterways; wilderness; recreation facilities; or tribal lands? ☑ No ☐ Yes (describe)

2. Construction Activities and/or Operation

a. Identify project structure(s), power line(s), pipeline(s), utilities system(s), right-of-way(s) or road(s) that will be constructed and clearly mark them on a project site map or topographic map as appropriate. ☐ None

Relays will be installed within existing substations.

b. Would the proposed project require the construction of waste pits or settling ponds?

☑ No ☐ Yes (describe and identify location, and estimate surface area disturbed)

c. Would the proposed project affect any existing body of water? ☑ No ☐ Yes (describe)

d. Would the proposed project impact a floodplain or wetland? ☑ No ☐ Yes (describe)

e. Would the proposed project potentially cause runoff/sedimentation/erosion? ☑ No ☐ Yes (describe)

f. Would the proposed project include activities located on perma-frost, near fault zones, or involve fracturing, well drilling, geologic stimulation, sequestration, active seismic data collection, and/or deepwater operations?

☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

g. Would the proposed project involve any of the following: nanotechnology; recombinant DNA or genetic engineering; facility decommissioning or disposition of equipment/materials; or management of radioactive wastes/materials?
☑ No ☐ Yes (describe)

3. Biological Resources

a. Identify any State or Federally listed endangered or threatened plant or animal species potentially affected by the proposed project.
☑ None

b. Would any designated critical habitat be affected by the proposed project? ☑ No ☐ Yes (describe)

c. Describe any impacts that construction would have on any other types of sensitive or unique habitats.
☑ No planned construction ☐ No habitats ☐ None ☐ Impact (describe)

d. Would any foreign substances/materials be introduced into ground or surface waters, soil, or other earth/geologic resource because of project activities? How would these foreign substances/materials affect the water, soil, biota, and geologic resources? ☑ No ☐ Yes (describe)

e. Would any migratory animal corridors be impacted or disrupted by the proposed project? ☑ No ☐ Yes (describe)

4. Socioeconomic and Infrastructure Conditions

a. Would local socio-economic changes result from the proposed project? ☑ No ☐ Yes (describe)

b. Would the proposed project generate increased traffic use of roads through local neighborhoods, urban or rural areas?
☑ No ☐ Yes (describe)

c. Would the proposed project require new transportation access (roads, rail, etc.)? Describe location, impacts, costs.
☑ No ☐ Yes (describe)

d. Would the proposed project create a significant increase in local energy usage? ☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

5. Historical/Cultural Resources

a. Describe any historical, archaeological, or cultural sites in the vicinity of the proposed project; note any sites included on the National Register of Historic Places. ☑ None

b. Would construction or operational activities planned under the proposed project disturb any historical, archaeological, or cultural sites? ☐ No planned construction ☑ No historic sites ☐ Yes (describe) ☐ No Impact (discuss)

c. Has the State Historic Preservation Office been contacted with regard to this project? ☑ No ☐ Yes (describe)

Not applicable.

d. Would the proposed project interfere with visual resources (e.g., eliminate scenic views) or alter the present landscape?
☑ No ☐ Yes (describe)

e. Would the proposed project be located on or adjacent to tribal lands, lands considered to be sacred, or lands used for traditional purposes? Describe any known tribal sensitivities for the proposed project area.

Relays will be installed within existing substations, which may be adjacent to but have no impact on such locations.

6. Atmospheric Conditions/Air Quality

a. Identify air quality conditions in the immediate vicinity of the proposed project with regard to attainment of National Ambient Air Quality Standards (NAAQS). This information is available under the Green Book Non-Attainment Areas for Criteria Pollutants located at http://www.epa.gov/air/oaqps/greenbk/astate.html

	Attainment	Non-Attainment
O_3 - 1 Hour	☑	☐
O_3 - 8 Hour	☑	☐
SO_x	☑	☐
PM - 2.5	☑	☐
PM - 10	☑	☐
CO	☑	☐
NO_2	☑	☐
Lead	☑	☐

b. Would proposed project require issuance of new or modified local, state, or federal air permits to perform project related work and activities? ☑ No ☐ Yes (describe)

c. Would the proposed project be in compliance with local and state air quality requirements? ☑ Yes
If not, please explain.

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ENVIRONMENTAL QUESTIONNAIRE

d. Would the proposed project be classified as either a New Source or a major modification to an existing source?
☑ No ☐ Yes (describe)

e. What types of air emissions, including fugitive emissions, would be anticipated from the proposed project, and what would be the maximum annual rate of emissions for the project?

	Maximum per Year	Total for Project
☐ SO_x		
☐ NO_x		
☐ PM - 2.5		
☐ PM - 10		
☐ CO		
☐ CO_2		
☐ Lead		
☐ H_2S		
☐ Organic solvent vapors or other volatile organic compounds--List:		
☐ Hazardous air pollutants -- List:		
☐ Other -- List:		
☑ None		

f. Would any types of emission control or particulate collection devices be used?
☑ No ☐ Yes (describe, including collection efficiencies)

g. How would emissions be vented?

Not applicable.

7. Hydrologic Conditions/Water Quality

a. What nearby water bodies may be affected by the proposed project? Provide distance(s) from the project site.

No bodies of water are anticipated to be affected by the proposed project, however, this would be confirmed during design by an internal environmental review.

b. What sources would supply potable and process water for the proposed project?

Not applicable.

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ENVIRONMENTAL QUESTIONNAIRE

c. Quantify the wastewater that would be generated by the proposed project.

	Gallons/day	Gallons/year
☐ Non-contact cooling water		
☐ Process water		
☐ Sanitary		
☐ Other -- describe:		
☑ None		

d. What would be the major components of each type of wastewater (e.g., coal fines)? ☑ No wastewater produced

e. Identify the local treatment facility that would receive wastewater from the proposed project.
☑ No discharges to local treatment facility

f. Describe how wastewater would be collected and treated. ☑ No wastewater produced

g. Would any run-off or leachates be produced from storage piles or waste disposal sites? ☑ No ☐ Yes (describe source)

h. Would project require issuance of new or modified water permits to perform project work or site development activities?
☑ No ☐ Yes (describe)

i. Where would wastewater effluents from the proposed project be discharged? ☑ No wastewater produced

j. Would the proposed project be permitted to discharge effluents into an existing body of water?
☑ No ☐ Yes (describe water use and effluent impact)

k. Would a new or modified National Pollutant Discharge Elimination System (NPDES) permit be required?
☑ No ☐ Yes (describe)

l. Would the proposed project adversely affect the quality or movement of groundwater? ☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

m. Would the proposed project require issuance of an Underground Injection Control (UIC) permit?

☑ No ☐ Yes (describe)

n. Would the proposed project be located in or near a wellhead protection area, drinking water protection area, or above a sole source aquifer or underground source of drinking water (USDW)?

☑ No ☐ Yes (describe)

During design, internal environmental reviews would identify such areas, however, the project is not expected to introduce new risks to existing above/below ground sources.

8. Solid and Hazardous Wastes

a. Identify and estimate wastes that would be generated from the project. Solid wastes are defined as any solid, liquid, semi-solid, or contained gaseous material that is discarded, has served its intended purpose, or is a manufacturing or mining by-product (See EPA Municipal Solid Waste and Municipal Solid Waste by State).

	Annual Quantity
☐ **Municipal solid waste (e.g., paper, plastic, etc.)**	
☐ **Coal or coal by-products**	
☑ **Other -- Identify:** Replaced relays	170 units
☐ **Hazardous waste – Identify:**	
☐ **None**	

b. Would project require issuance of new or modified solid waste and/or hazardous waste related permits to perform project work activities? ☑ No ☐ Yes (explain)

c. How and where would solid waste disposal be accomplished?

☐ None generated
☐ On-site (identify and describe location)
☑ Off-site (identify location and describe facility and treatment)

Replaced relays will be returned to our Providence, Rhode Island facility for recycling.

d. How would wastes for disposal be transported?

Utility truck.

e. Describe hazardous wastes that would be generated, treated, handled, or stored under this project. Hazardous waste information can be found at EPA Hazardous Waste website. ☑ None

f. How would hazardous or toxic waste be collected and stored? ☑ None used or produced

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ENVIRONMENTAL QUESTIONNAIRE

g. If hazardous wastes would require off-site disposal, have arrangements been made with a certified TSD (Treatment, Storage, and Disposal) facility?

☑ Not required ☐ Arrangements not yet made ☐ Arrangements made with a certified TSD facility (identify)

9. Health/Safety Factors

a. Identify hazardous or toxic materials that would be used in the proposed project.

☑ None ☐ Hazardous or toxic materials that would be used (identify):

b. Describe the potential impacts of this project's hazardous materials on human health and the environment.

☑ None

c. Would there be any special physical hazards or health risks associated with the project? ☑ No ☐ Yes (describe)

d. Does a worker safety program exist at the location of the proposed project? ☐ No ☑ Yes (describe)

Current Health & Safety policies and procedures will be implemented during all phases of the proposed project.

e. Would additional safety training be necessary for any new laboratory, equipment, or processes involved with the project?

☑ No ☐ Yes (describe)

f. Describe any increases in ambient noise levels to the public from construction and operational activities.

☑ None ☐ Increase in ambient noise level (describe)

g. Would project construction result in the removal of natural or other barriers that act as noise screens?

☑ No construction planned ☐ No ☐ Yes (describe)

h. Would hearing protection be required for workers? ☐ No ☑ Yes (describe)

If needed, as dictated by current Health & Safety policies and procedures.

10. Environmental Restoration and/or Waste Management

a. Would the proposed project include CERCLA removals or similar actions under RCRA or other authorities?

☑ No ☐ Yes (describe)

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ENVIRONMENTAL QUESTIONNAIRE

b. Would the proposed project include siting, construction, and operation of temporary pilot-scale waste collection and treatment facilities or pilot-scale waste stabilization and containment facilities? ☑ No ☐ Yes (describe)

c. Would the proposed project involve operations of environmental monitoring and control systems?
☑ No ☐ Yes (describe)

d. Would the proposed project involve siting, construction, operation, or decommissioning of a facility for storing packaged hazardous waste for 90 days or less? ☑ No ☐ Yes (describe)

E. REGULATORY COMPLIANCE

1. For the following laws, describe any existing permits, new or modified permits, manifests, responsible authorities or agencies, contacts, etc., that would be required for the proposed project

a. Resource Conservation and Recovery Act (RCRA): ☑ None ☐ New Required ☐ Modification Required
Describe:

b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):
☑ None ☐ New Required ☐ Modification Required
Describe:

c. Toxic Substance Control Act (TSCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

d. Clean Water Act (CWA): ☑ None ☐ New Required ☐ Modification Required
Describe:

e. Underground Storage Tank Control Program (UST): ☑ None ☐ New Required ☐ Modification Required
Describe:

f. Underground Injection Control Program (UIC): ☑ None ☐ New Required ☐ Modification Required
Describe:

g. Clean Air Act (CAA): ☑ None ☐ New Required ☐ Modification Required
Describe:

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ENVIRONMENTAL QUESTIONNAIRE

h. Endangered Species Act (ESA): ☑ None ☐ New Required ☐ Modification Required
Describe:

i. Floodplains and Wetlands Regulations: ☑ None ☐ New Required ☐ Modification Required
Describe:

j. Fish and Wildlife Coordination Act (FWCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

k. National Historic Preservation Act (NHPA): ☑ None ☐ New Required ☐ Modification Required
Describe:

l. Coastal Zone Management Act (CZMA): ☑ None ☐ New Required ☐ Modification Required
Describe:

2. Identify any other environmental laws and regulations (Federal, state, and local) for which compliance would be necessary for this project, and describe the permits, manifests, and contacts that would be required.

None.

F. DESCRIBE ANY ISSUES THAT WOULD GENERATE PUBLIC CONTROVERSY REGARDING THE PROPOSED PROJECT. ☑ None

G. WOULD THE PROPOSED PROJECT PRODUCE ADDITIONAL DEVELOPMENT, OR ARE OTHER MAJOR DEVELOPMENTS PLANNED OR UNDERWAY, IN THE PROJECT AREA?

☑ No ☐ Yes (describe)

H. SUMMARIZE THE SIGNIFICANT IMPACTS THAT WOULD RESULT FROM THE PROPOSED PROJECT.

☑ None (provide supporting detail) ☐ Significant impacts (describe)

There are no significant impacts anticipated as a result of this project.

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ENVIRONMENTAL QUESTIONNAIRE

I. PROVIDE A DESCRIPTION OF HOW THE PROJECT WOULD BE DECOMMISSIONED, INCLUDING THE DISPOSITION OF EQUIPMENT AND MATERIALS.

Upon decommissioning, hardware and utility poles would be returned to our facility in Providence, Rhode Island for re-use, recycling, or disposal at a licensed solid waste facility.

III. CERTIFICATION BY PROPOSER

I hereby certify that the information provided herein is current, accurate, and complete as of the date shown immediately below.

Signature: Kathy Castro Digitally signed by Kathy Castro Date: 2023.03.14 09:13:28 -04'00'

Date (mm/dd/yyyy): 03/14/2023

Typed Name: Kathy Castro

Title: Director of Asset Management and Planning

Organization: Rhode Island Energy

IV. REVIEW AND APPROVAL BY DOE

I hereby certify that I have reviewed the information provided in this questionnaire, have determined that all questions have been appropriately answered, and judge the responses to be consistent with the efforts proposed.

DOE Project Manager

Signature:

Date (mm/dd/yyyy):

Typed Name:

NETL F 451.1-1/3
Revised: 12/3/2014
Reviewed: 12/3/2014
(Previous Editions Obsolete)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. INSTRUCTIONS

The proposer shall prepare this Environmental Questionnaire (EQ) as accurately and completely as possible. Supporting information can be provided as attachments. The proposer must identify the location of the project and specifically describe the activities that would occur at that location. The proposer must provide specific information and quantities, regarding air emissions, wastewater discharges, solid wastes, etc., to facilitate the necessary review. In addition, the proposer must submit with this EQ a FINAL copy of the project's statement of work (SOW) or statement of project objective (SOPO) that will be used in the contract/agreement between the proposer and the U.S Department of Energy (DOE).

II. QUESTIONNAIRE

A. PROJECT SUMMARY

1. Solicitation/Project Number: DE-FOA-0002740 Proposer: TNEC d/b/a/ Rhode Island Energy
2. This Environmental Questionnaire pertains to a: ☒ Recipient or Prime Contractor ☐ Sub-recipient or Subcontractor
3. Principal Investigator: Bradford Labine Telephone Number: (b) (6)
4. Project Title: Smart Grid for Smart Decarbonization (TA-02: Smart Capacitors and Regulators)
5. Expected Project Duration: 5 Years
6. Location of Activities covered by **this** Environmental Questionnaire: (City/Township, County, State):
   State of Rhode Island
7. List the full scope of activities planned (only for the location that is the subject of this Environmental Questionnaire).
   Replace or upgrade 808 capacitors and replace 80 regulators to provide smart functionality, including feeding additional data to the Asset Hub and giving grid operators additional control.
8. List all other locations where work would be performed by the primary contractor of the project and subcontractor(s). Each of the following must have an individual Environmental Questionnaire.

Subcontractor or sub-recipient	Location of activities for this project

9. Identify and select the checkbox with the predominant project work activities under Group A, B, or C

Group A

☐ Routine administrative, procurement, training, and personnel actions. Contract activities/awards for management support, financial assistance, and technical services in support of agency business, programs, projects, and goals. Literature searches and information gathering, material inventories, property surveys; data analysis, computer modeling, analytical reviews, technical summary, conceptual design, feasibility studies, document preparation, data dissemination, and paper studies. Technical assistance including financial planning, assistance, classroom training, public meetings, management training, survey participation, academic contribution, technical consultation, and stakeholders surveys. Workshop and conference planning, preparation, and implementation which may involve promoting energy efficiency, renewable energy, and energy conservation.

STOP! ***If all work activities related to this project can be classified and described within categories under Group A, proceed directly to Section III CERTIFICATION BY PROPOSER. No additional information is required.***
If project work activities are described in either Group(s) B or C; then continue filling out questionnaire.

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ENVIRONMENTAL QUESTIONNAIRE

Group B

☐ Laboratory Scale Research, Bench Scale Research, Pilot Scale Research, Proof-of-Concept Scale Research, or Field Test Research. Work DOES NOT involve new building/facilities construction and site excavation/groundbreaking activities. This work typically involves routine operation of existing laboratories, commercial buildings/properties, offices and homes, project test facilities, factories/power plants, vehicles test stands and components, refueling facilities, utility systems, or other existing structures/facilities. Work will NOT involve major change in facilities missions and operations, land use planning, new/modified regulatory/operating permit requirements. Includes work specific to routine DOE Site operations and Lab research work activities, but NOT building construction and site preparation. DOE work typically involves laboratory facilities and lab equipment operations, buildings and grounds management activities; and buildings and facilities maintenance, repairs, reconfiguration, remodeling, equipment use and replacement.

Group C

☑ Pilot Test Facilities Construction, Pilot Scale Research, Field Scale Demonstration, or Commercial Scale Application. Work typically involves facility construction, site preparation/excavation/groundbreaking, and/or demolition. This work would include construction, retrofit, replacement, and/or major modifications of laboratories, test facilities, energy system prototypes, and power generation infrastructure. Work may also involve construction and maintenance of utilities system right-of-ways, roads, vehicle test facilities, commercial buildings/properties, fuel refinery/mixing facilities, refueling facility, power plants, underground wells, and pipelines, and other types of energy research related facilities. This work may require new or modified regulatory permits, environmental sampling and monitoring requirements, master planning, public involvement, and environmental impact review. Includes work specific to DOE Site Operations and Lab operation activities involving building and facilities construction, replacement, decommissioning/demolition, site preparation, land use changes, or change in research facilities mission or operations.

B. PROPOSED PROJECT ALTERNATIVES

1. If applicable, list any project alternatives considered to achieve the project objectives.

No feasible alternatives that will achieve the project objectives.

C. PROJECT LOCATION

1. Provide a brief description of the project location (physical location, surrounding area, adjacent structures).

TNEC's service area in the State of Rhode Island: 1076 square miles.

2. **Attach** a project site location map of the project work area.

N/A

D. ENVIRONMENTAL IMPACTS

NEPA procedures require evaluations of possible effects (including land use, energy resource use, natural, historic and cultural resources, and pollutants) from proposed projects on the environment.

1. Land Use

a. Characterize present land use where the proposed project would be located.

☑ Urban	☑ Industrial	☑ Commercial	☐ Agricultural
☑ Suburban	☑ Rural	☑ Residential	☐ Research Facilities
☐ Forest	☐ University Campus	☐ Other: _____	

b. Identify the total size of the facility, structure, or system and what portion would be used for the proposed project.

Replace or upgrade 808 capacitors and replace 80 regulators throughout the state.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

c. Describe planned construction, installation, and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, laboratories, storage tanks, fueling facilities, underground wells, pipelines, or other structures.

☐ No construction would be anticipated for this project.

Regulators and capacitors will be installed at existing locations, requiring minimal amount of work for installation. Select poles will be replaced, in-kind, as necessary.

d. Describe how land use would be affected by operational activities associated with the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

e. Describe any plans to reclaim areas that would be affected by the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

f. Would the proposed project affect any unique or unusual landforms (e.g., cliffs, waterfalls, etc.)?

☑ No ☐ Yes (describe)

g. Would the proposed project be located in or near local, state, or federal parks; forests; monuments; scenic waterways; wilderness; recreation facilities; or tribal lands? ☐ No ☑ Yes (describe)

The infrastructure upon which the regulators and capacitors are to be installed may be located in or near areas as categorized above, but no adverse effects are anticipated.

2. Construction Activities and/or Operation

a. Identify project structure(s), power line(s), pipeline(s), utilities system(s), right-of-way(s) or road(s) that will be constructed and clearly mark them on a project site map or topographic map as appropriate. ☐ None

Regulators and capacitors will be installed on existing infrastructure.

b. Would the proposed project require the construction of waste pits or settling ponds?

☑ No ☐ Yes (describe and identify location, and estimate surface area disturbed)

c. Would the proposed project affect any existing body of water? ☑ No ☐ Yes (describe)

d. Would the proposed project impact a floodplain or wetland? ☐ No ☑ Yes (describe)

During design, internal environmental reviews would identify potential impacts to flood plains or wetlands and take measures to ensure compliance with local/state/federal laws.

e. Would the proposed project potentially cause runoff/sedimentation/erosion? ☐ No ☑ Yes (describe)

During design, internal environmental reviews would identify required measures for avoidance/management of these issues to ensure compliance with local/state/federal laws.

f. Would the proposed project include activities located on perma-frost, near fault zones, or involve fracturing, well drilling, geologic stimulation, sequestration, active seismic data collection, and/or deepwater operations?

☑ No ☐ Yes (describe)

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ENVIRONMENTAL QUESTIONNAIRE

g. Would the proposed project involve any of the following: nanotechnology; recombinant DNA or genetic engineering; facility decommissioning or disposition of equipment/materials; or management of radioactive wastes/materials?
☑ No ☐ Yes (describe)

3. Biological Resources

a. Identify any State or Federally listed endangered or threatened plant or animal species potentially affected by the proposed project.
☑ None

During design, internal environmental reviews will identify potentially affected state/federally listed endangered/threatened species to be avoided or mitigated.

b. Would any designated critical habitat be affected by the proposed project? ☐ No ☑ Yes (describe)

During design, internal environmental reviews will identify critical habitats to be avoided or provide measures to mitigate impacts if unavoidable.

c. Describe any impacts that construction would have on any other types of sensitive or unique habitats.
☑ No planned construction ☐ No habitats ☐ None ☐ Impact (describe)

d. Would any foreign substances/materials be introduced into ground or surface waters, soil, or other earth/geologic resource because of project activities? How would these foreign substances/materials affect the water, soil, biota, and geologic resources? ☑ No ☐ Yes (describe)

e. Would any migratory animal corridors be impacted or disrupted by the proposed project? ☑ No ☐ Yes (describe)

4. Socioeconomic and Infrastructure Conditions

a. Would local socio-economic changes result from the proposed project? ☑ No ☐ Yes (describe)

b. Would the proposed project generate increased traffic use of roads through local neighborhoods, urban or rural areas?
☑ No ☐ Yes (describe)

c. Would the proposed project require new transportation access (roads, rail, etc.)? Describe location, impacts, costs.
☑ No ☐ Yes (describe)

d. Would the proposed project create a significant increase in local energy usage? ☑ No ☐ Yes (describe)

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ENVIRONMENTAL QUESTIONNAIRE

5. Historical/Cultural Resources

a. Describe any historical, archaeological, or cultural sites in the vicinity of the proposed project; note any sites included on the National Register of Historic Places. ☑ None

b. Would construction or operational activities planned under the proposed project disturb any historical, archaeological, or cultural sites? ☐ No planned construction ☑ No historic sites ☐ Yes (describe) ☐ No Impact (discuss)

c. Has the State Historic Preservation Office been contacted with regard to this project? ☑ No ☐ Yes (describe)

Not applicable.

d. Would the proposed project interfere with visual resources (e.g., eliminate scenic views) or alter the present landscape?
☑ No ☐ Yes (describe)

e. Would the proposed project be located on or adjacent to tribal lands, lands considered to be sacred, or lands used for traditional purposes? Describe any known tribal sensitivities for the proposed project area.

Smart capacitors and regulators will be installed on existing infrastructure, which may be on or adjacent to, but have no adverse impact on, such locations.

6. Atmospheric Conditions/Air Quality

a. Identify air quality conditions in the immediate vicinity of the proposed project with regard to attainment of National Ambient Air Quality Standards (NAAQS). This information is available under the Green Book Non-Attainment Areas for Criteria Pollutants located at http://www.epa.gov/air/oaqps/greenbk/astate.html

	Attainment	Non-Attainment
O_3 - 1 Hour	☑	☐
O_3 - 8 Hour	☑	☐
SO_x	☑	☐
PM - 2.5	☑	☐
PM - 10	☑	☐
CO	☑	☐
NO_2	☑	☐
Lead	☑	☐

b. Would proposed project require issuance of new or modified local, state, or federal air permits to perform project related work and activities? ☑ No ☐ Yes (describe)

c. Would the proposed project be in compliance with local and state air quality requirements? ☑ Yes
If not, please explain.

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ENVIRONMENTAL QUESTIONNAIRE

d. Would the proposed project be classified as either a New Source or a major modification to an existing source?
☑ No ☐ Yes (describe)

e. What types of air emissions, including fugitive emissions, would be anticipated from the proposed project, and what would be the maximum annual rate of emissions for the project?

	Maximum per Year	Total for Project
☐ SO_x		
☐ NO_x		
☐ PM - 2.5		
☐ PM - 10		
☐ CO		
☐ CO_2		
☐ Lead		
☐ H_2S		
☐ Organic solvent vapors or other volatile organic compounds--List:		
☐ Hazardous air pollutants -- List:		
☐ Other -- List:		
☑ None		

f. Would any types of emission control or particulate collection devices be used?
☑ No ☐ Yes (describe, including collection efficiencies)

g. How would emissions be vented?

Not applicable.

7. Hydrologic Conditions/Water Quality

a. What nearby water bodies may be affected by the proposed project? Provide distance(s) from the project site.

No bodies of water are anticipated to be affected by the proposed project, however, this would be confirmed during design by an internal environmental review.

b. What sources would supply potable and process water for the proposed project?

Not applicable.

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c. Quantify the wastewater that would be generated by the proposed project.

	Gallons/day	Gallons/year
☐ Non-contact cooling water		
☐ Process water		
☐ Sanitary		
☐ Other -- describe:		
☑ None		

d. What would be the major components of each type of wastewater (e.g., coal fines)? ☑ No wastewater produced

e. Identify the local treatment facility that would receive wastewater from the proposed project.
☑ No discharges to local treatment facility

f. Describe how wastewater would be collected and treated. ☑ No wastewater produced

g. Would any run-off or leachates be produced from storage piles or waste disposal sites? ☑ No ☐ Yes (describe source)

h. Would project require issuance of new or modified water permits to perform project work or site development activities?
☑ No ☐ Yes (describe)

i. Where would wastewater effluents from the proposed project be discharged? ☑ No wastewater produced

j. Would the proposed project be permitted to discharge effluents into an existing body of water?
☑ No ☐ Yes (describe water use and effluent impact)

k. Would a new or modified National Pollutant Discharge Elimination System (NPDES) permit be required?
☑ No ☐ Yes (describe)

l. Would the proposed project adversely affect the quality or movement of groundwater? ☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

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m. Would the proposed project require issuance of an Underground Injection Control (UIC) permit?

☑ No ☐ Yes (describe)

n. Would the proposed project be located in or near a wellhead protection area, drinking water protection area, or above a sole source aquifer or underground source of drinking water (USDW)?

☑ No ☐ Yes (describe)

During design, internal environmental reviews would identify such areas, however, the project is not expected to introduce new risks to existing above/below ground sources.

8. Solid and Hazardous Wastes

a. Identify and estimate wastes that would be generated from the project. Solid wastes are defined as any solid, liquid, semi-solid, or contained gaseous material that is discarded, has served its intended purpose, or is a manufacturing or mining by-product (See EPA Municipal Solid Waste and Municipal Solid Waste by State).

	Annual Quantity
☐ **Municipal solid waste (e.g., paper, plastic, etc.)**	
☐ **Coal or coal by-products**	
☑ **Other -- Identify:** Replaced poles/hardware.	Indeterminate
☐ **Hazardous waste – Identify:**	
☐ **None**	

b. Would project require issuance of new or modified solid waste and/or hazardous waste related permits to perform project work activities? ☑ No ☐ Yes (explain)

c. How and where would solid waste disposal be accomplished?

☐ None generated
☐ On-site (identify and describe location)
☑ Off-site (identify location and describe facility and treatment)

Replaced poles will be returned to our facility for disposal at a licensed disposal facility and/or chipped for use as boiler fuel. Hardware will be recycled or similarly disposed of.

d. How would wastes for disposal be transported?

Utility truck.

e. Describe hazardous wastes that would be generated, treated, handled, or stored under this project. Hazardous waste information can be found at EPA Hazardous Waste website. ☑ None

f. How would hazardous or toxic waste be collected and stored? ☑ None used or produced

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g. If hazardous wastes would require off-site disposal, have arrangements been made with a certified TSD (Treatment, Storage, and Disposal) facility?

☑ Not required ☐ Arrangements not yet made ☐ Arrangements made with a certified TSD facility (identify)

9. Health/Safety Factors

a. Identify hazardous or toxic materials that would be used in the proposed project.

☑ None ☐ Hazardous or toxic materials that would be used (identify):

b. Describe the potential impacts of this project's hazardous materials on human health and the environment.

☑ None

c. Would there be any special physical hazards or health risks associated with the project? ☑ No ☐ Yes (describe)

d. Does a worker safety program exist at the location of the proposed project? ☐ No ☑ Yes (describe)

Current Health & Safety policies and procedures will be implemented during all phases of the proposed project.

e. Would additional safety training be necessary for any new laboratory, equipment, or processes involved with the project?

☑ No ☐ Yes (describe)

f. Describe any increases in ambient noise levels to the public from construction and operational activities.

☐ None ☑ Increase in ambient noise level (describe)

Limited increase in ambient noise levels would occur if pole replacement is required.

g. Would project construction result in the removal of natural or other barriers that act as noise screens?

☑ No construction planned ☐ No ☐ Yes (describe)

h. Would hearing protection be required for workers? ☐ No ☑ Yes (describe)

If needed, as dictated by current Health & Safety policies and procedures.

10. Environmental Restoration and/or Waste Management

a. Would the proposed project include CERCLA removals or similar actions under RCRA or other authorities?

☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

b. Would the proposed project include siting, construction, and operation of temporary pilot-scale waste collection and treatment facilities or pilot-scale waste stabilization and containment facilities? ☑ No ☐ Yes (describe)

c. Would the proposed project involve operations of environmental monitoring and control systems?
☑ No ☐ Yes (describe)

d. Would the proposed project involve siting, construction, operation, or decommissioning of a facility for storing packaged hazardous waste for 90 days or less? ☑ No ☐ Yes (describe)

E. REGULATORY COMPLIANCE

1. For the following laws, describe any existing permits, new or modified permits, manifests, responsible authorities or agencies, contacts, etc., that would be required for the proposed project

a. Resource Conservation and Recovery Act (RCRA): ☑ None ☐ New Required ☐ Modification Required
Describe:

b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):
☑ None ☐ New Required ☐ Modification Required
Describe:

c. Toxic Substance Control Act (TSCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

d. Clean Water Act (CWA): ☑ None ☐ New Required ☐ Modification Required
Describe:

e. Underground Storage Tank Control Program (UST): ☑ None ☐ New Required ☐ Modification Required
Describe:

f. Underground Injection Control Program (UIC): ☑ None ☐ New Required ☐ Modification Required
Describe:

g. Clean Air Act (CAA): ☑ None ☐ New Required ☐ Modification Required
Describe:

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

h. Endangered Species Act (ESA): ☑ None ☐ New Required ☐ Modification Required
Describe:

i. Floodplains and Wetlands Regulations: ☑ None ☐ New Required ☐ Modification Required
Describe:

j. Fish and Wildlife Coordination Act (FWCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

k. National Historic Preservation Act (NHPA): ☑ None ☐ New Required ☐ Modification Required
Describe:

l. Coastal Zone Management Act (CZMA): ☑ None ☐ New Required ☐ Modification Required
Describe:

2. Identify any other environmental laws and regulations (Federal, state, and local) for which compliance would be necessary for this project, and describe the permits, manifests, and contacts that would be required.

None. All work will be performed under existing exemptions.

F. DESCRIBE ANY ISSUES THAT WOULD GENERATE PUBLIC CONTROVERSY REGARDING THE PROPOSED PROJECT. ☑ None

G. WOULD THE PROPOSED PROJECT PRODUCE ADDITIONAL DEVELOPMENT, OR ARE OTHER MAJOR DEVELOPMENTS PLANNED OR UNDERWAY, IN THE PROJECT AREA?

☑ No ☐ Yes (describe)

H. SUMMARIZE THE SIGNIFICANT IMPACTS THAT WOULD RESULT FROM THE PROPOSED PROJECT.

☑ None (provide supporting detail) ☐ Significant impacts (describe)

There are no significant impacts anticipated as a result of this project.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. PROVIDE A DESCRIPTION OF HOW THE PROJECT WOULD BE DECOMMISSIONED, INCLUDING THE DISPOSITION OF EQUIPMENT AND MATERIALS.

Upon decommissioning, hardware and utility poles would be returned to our facility in Providence, Rhode Island for re-use, recycling, or disposal at a licensed solid waste facility.

III. CERTIFICATION BY PROPOSER

I hereby certify that the information provided herein is current, accurate, and complete as of the date shown immediately below.

Signature: Kathy Castro Digitally signed by Kathy Castro Date: 2023.03.14 09:14:14 -04'00'

Date (mm/dd/yyyy): 03/14/2023

Typed Name: Kathy Castro

Title: Director of Asset Management and Planning

Organization: Rhode Island Energy

IV. REVIEW AND APPROVAL BY DOE

I hereby certify that I have reviewed the information provided in this questionnaire, have determined that all questions have been appropriately answered, and judge the responses to be consistent with the efforts proposed.

DOE Project Manager

Signature:

Date (mm/dd/yyyy):

Typed Name:

NETL F 451.1-1/3
Revised: 12/3/2014
Reviewed: 12/3/2014
(Previous Editions Obsolete)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. INSTRUCTIONS

The proposer shall prepare this Environmental Questionnaire (EQ) as accurately and completely as possible. Supporting information can be provided as attachments. The proposer must identify the location of the project and specifically describe the activities that would occur at that location. The proposer must provide specific information and quantities, regarding air emissions, wastewater discharges, solid wastes, etc., to facilitate the necessary review. In addition, the proposer must submit with this EQ a FINAL copy of the project's statement of work (SOW) or statement of project objective (SOPO) that will be used in the contract/agreement between the proposer and the U.S Department of Energy (DOE).

II. QUESTIONNAIRE

A. PROJECT SUMMARY

1. Solicitation/Project Number: DE-FOA-0002740 Proposer: TNEC d/b/a/ Rhode Island Energy
2. This Environmental Questionnaire pertains to a: ☒ Recipient or Prime Contractor ☐ Sub-recipient or Subcontractor
3. Principal Investigator: Bradford Labine Telephone Number: (b) (6)
4. Project Title: Smart Grid for Smart Decarbonization (TA-02: Fiber-Optic Cables)
5. Expected Project Duration: 5 Years
6. Location of Activities covered by **this** Environmental Questionnaire: (City/Township, County, State):
   State of Rhode Island
7. List the full scope of activities planned (only for the location that is the subject of this Environmental Questionnaire).
   Replace existing leased cellular services with 100 miles of private fiber-optic cables to support communication between substation relays and central grid operations.
8. List all other locations where work would be performed by the primary contractor of the project and subcontractor(s). Each of the following must have an individual Environmental Questionnaire.

Subcontractor or sub-recipient	Location of activities for this project

9. Identify and select the checkbox with the predominant project work activities under Group A, B, or C

Group A

☐ Routine administrative, procurement, training, and personnel actions. Contract activities/awards for management support, financial assistance, and technical services in support of agency business, programs, projects, and goals. Literature searches and information gathering, material inventories, property surveys; data analysis, computer modeling, analytical reviews, technical summary, conceptual design, feasibility studies, document preparation, data dissemination, and paper studies. Technical assistance including financial planning, assistance, classroom training, public meetings, management training, survey participation, academic contribution, technical consultation, and stakeholders surveys. Workshop and conference planning, preparation, and implementation which may involve promoting energy efficiency, renewable energy, and energy conservation.

STOP! ***If all work activities related to this project can be classified and described within categories under Group A, proceed directly to Section III CERTIFICATION BY PROPOSER. No additional information is required.***
If project work activities are described in either Group(s) B or C; then continue filling out questionnaire.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

Group B

☐ Laboratory Scale Research, Bench Scale Research, Pilot Scale Research, Proof-of-Concept Scale Research, or Field Test Research. Work DOES NOT involve new building/facilities construction and site excavation/groundbreaking activities. This work typically involves routine operation of existing laboratories, commercial buildings/properties, offices and homes, project test facilities, factories/power plants, vehicles test stands and components, refueling facilities, utility systems, or other existing structures/facilities. Work will NOT involve major change in facilities missions and operations, land use planning, new/modified regulatory/operating permit requirements. Includes work specific to routine DOE Site operations and Lab research work activities, but NOT building construction and site preparation. DOE work typically involves laboratory facilities and lab equipment operations, buildings and grounds management activities; and buildings and facilities maintenance, repairs, reconfiguration, remodeling, equipment use and replacement.

Group C

☑ Pilot Test Facilities Construction, Pilot Scale Research, Field Scale Demonstration, or Commercial Scale Application. Work typically involves facility construction, site preparation/excavation/groundbreaking, and/or demolition. This work would include construction, retrofit, replacement, and/or major modifications of laboratories, test facilities, energy system prototypes, and power generation infrastructure. Work may also involve construction and maintenance of utilities system right-of-ways, roads, vehicle test facilities, commercial buildings/properties, fuel refinery/mixing facilities, refueling facility, power plants, underground wells, and pipelines, and other types of energy research related facilities. This work may require new or modified regulatory permits, environmental sampling and monitoring requirements, master planning, public involvement, and environmental impact review. Includes work specific to DOE Site Operations and Lab operation activities involving building and facilities construction, replacement, decommissioning/demolition, site preparation, land use changes, or change in research facilities mission or operations.

B. PROPOSED PROJECT ALTERNATIVES

1. If applicable, list any project alternatives considered to achieve the project objectives.

No feasible alternatives that will achieve the project objectives.

C. PROJECT LOCATION

1. Provide a brief description of the project location (physical location, surrounding area, adjacent structures).

TNEC's service area in the State of Rhode Island: 1076 square miles.

2. **Attach** a project site location map of the project work area.

N/A

D. ENVIRONMENTAL IMPACTS

NEPA procedures require evaluations of possible effects (including land use, energy resource use, natural, historic and cultural resources, and pollutants) from proposed projects on the environment.

1. Land Use

a. Characterize present land use where the proposed project would be located.

☑ Urban	☑ Industrial	☑ Commercial	☐ Agricultural
☑ Suburban	☑ Rural	☑ Residential	☐ Research Facilities
☐ Forest	☐ University Campus	☐ Other: _____	

b. Identify the total size of the facility, structure, or system and what portion would be used for the proposed project.

Installation of 100 miles of back-haul fiber network.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

c. Describe planned construction, installation, and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, laboratories, storage tanks, fueling facilities, underground wells, pipelines, or other structures.

☐ No construction would be anticipated for this project.

Fiber will be installed on existing utility poles whenever feasible, with new/replacement poles erected as needed, on TNEC property or within existing rights of way.

d. Describe how land use would be affected by operational activities associated with the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

e. Describe any plans to reclaim areas that would be affected by the proposed project.

☑ No land areas would be affected.

Current land use would not be affected.

f. Would the proposed project affect any unique or unusual landforms (e.g., cliffs, waterfalls, etc.)?

☑ No ☐ Yes (describe)

g. Would the proposed project be located in or near local, state, or federal parks; forests; monuments; scenic waterways; wilderness; recreation facilities; or tribal lands? ☐ No ☑ Yes (describe)

The infrastructure upon which the fiber is to be installed may be located in or near areas as categorized above, but no adverse effects are anticipated.

2. Construction Activities and/or Operation

a. Identify project structure(s), power line(s), pipeline(s), utilities system(s), right-of-way(s) or road(s) that will be constructed and clearly mark them on a project site map or topographic map as appropriate. ☐ None

The 100 miles of fiber will be extended to all RIE distribution substations with an additional fiber loop developed for redundancy.

b. Would the proposed project require the construction of waste pits or settling ponds?

☑ No ☐ Yes (describe and identify location, and estimate surface area disturbed)

c. Would the proposed project affect any existing body of water? ☑ No ☐ Yes (describe)

d. Would the proposed project impact a floodplain or wetland? ☐ No ☑ Yes (describe)

During design, internal environmental reviews would identify potential impacts to flood plains or wetlands and take measures to ensure compliance with local/state/federal laws.

e. Would the proposed project potentially cause runoff/sedimentation/erosion? ☐ No ☑ Yes (describe)

During design, internal environmental reviews would identify required measures for avoidance/management of these issues to ensure compliance with local/state/federal laws.

f. Would the proposed project include activities located on perma-frost, near fault zones, or involve fracturing, well drilling, geologic stimulation, sequestration, active seismic data collection, and/or deepwater operations?

☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

g. Would the proposed project involve any of the following: nanotechnology; recombinant DNA or genetic engineering; facility decommissioning or disposition of equipment/materials; or management of radioactive wastes/materials?
☑ No ☐ Yes (describe)

3. Biological Resources

a. Identify any State or Federally listed endangered or threatened plant or animal species potentially affected by the proposed project.
☑ None

During design, internal environmental reviews will identify potentially affected state/federally listed endangered/threatened species to be avoided or mitigated.

b. Would any designated critical habitat be affected by the proposed project? ☐ No ☑ Yes (describe)

During design, internal environmental reviews will identify critical habitats to be avoided or provide measures to mitigate impacts if unavoidable.

c. Describe any impacts that construction would have on any other types of sensitive or unique habitats.
☑ No planned construction ☐ No habitats ☐ None ☐ Impact (describe)

d. Would any foreign substances/materials be introduced into ground or surface waters, soil, or other earth/geologic resource because of project activities? How would these foreign substances/materials affect the water, soil, biota, and geologic resources? ☑ No ☐ Yes (describe)

e. Would any migratory animal corridors be impacted or disrupted by the proposed project? ☑ No ☐ Yes (describe)

4. Socioeconomic and Infrastructure Conditions

a. Would local socio-economic changes result from the proposed project? ☑ No ☐ Yes (describe)

b. Would the proposed project generate increased traffic use of roads through local neighborhoods, urban or rural areas?
☑ No ☐ Yes (describe)

c. Would the proposed project require new transportation access (roads, rail, etc.)? Describe location, impacts, costs.
☑ No ☐ Yes (describe)

d. Would the proposed project create a significant increase in local energy usage? ☑ No ☐ Yes (describe)

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ENVIRONMENTAL QUESTIONNAIRE

5. Historical/Cultural Resources

a. Describe any historical, archaeological, or cultural sites in the vicinity of the proposed project; note any sites included on the National Register of Historic Places. ☑ None

b. Would construction or operational activities planned under the proposed project disturb any historical, archaeological, or cultural sites? ☐ No planned construction ☑ No historic sites ☐ Yes (describe) ☐ No Impact (discuss)

c. Has the State Historic Preservation Office been contacted with regard to this project? ☑ No ☐ Yes (describe)

Not applicable.

d. Would the proposed project interfere with visual resources (e.g., eliminate scenic views) or alter the present landscape?
☑ No ☐ Yes (describe)

e. Would the proposed project be located on or adjacent to tribal lands, lands considered to be sacred, or lands used for traditional purposes? Describe any known tribal sensitivities for the proposed project area.

During design, internal environmental reviews would identify culturally sensitive areas in order to avoid adverse impacts.

6. Atmospheric Conditions/Air Quality

a. Identify air quality conditions in the immediate vicinity of the proposed project with regard to attainment of National Ambient Air Quality Standards (NAAQS). This information is available under the Green Book Non-Attainment Areas for Criteria Pollutants located at http://www.epa.gov/air/oaqps/greenbk/astate.html

	Attainment	Non-Attainment
O_3 - 1 Hour	☑	☐
O_3 - 8 Hour	☑	☐
SO_x	☑	☐
PM - 2.5	☑	☐
PM - 10	☑	☐
CO	☑	☐
NO_2	☑	☐
Lead	☑	☐

b. Would proposed project require issuance of new or modified local, state, or federal air permits to perform project related work and activities? ☑ No ☐ Yes (describe)

c. Would the proposed project be in compliance with local and state air quality requirements? ☑ Yes
If not, please explain.

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ENVIRONMENTAL QUESTIONNAIRE

d. Would the proposed project be classified as either a New Source or a major modification to an existing source?
☑ No ☐ Yes (describe)

e. What types of air emissions, including fugitive emissions, would be anticipated from the proposed project, and what would be the maximum annual rate of emissions for the project?

	Maximum per Year	Total for Project
☐ SO_x		
☐ NO_x		
☐ PM - 2.5		
☐ PM - 10		
☐ CO		
☐ CO_2		
☐ Lead		
☐ H_2S		
☐ Organic solvent vapors or other volatile organic compounds--List:		
☐ Hazardous air pollutants -- List:		
☐ Other -- List:		
☑ None		

f. Would any types of emission control or particulate collection devices be used?
☑ No ☐ Yes (describe, including collection efficiencies)

g. How would emissions be vented?

Not applicable.

7. Hydrologic Conditions/Water Quality

a. What nearby water bodies may be affected by the proposed project? Provide distance(s) from the project site.

No bodies of water are anticipated to be affected by the proposed project, however, this would be confirmed during design by an internal environmental review.

b. What sources would supply potable and process water for the proposed project?

Not applicable.

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ENVIRONMENTAL QUESTIONNAIRE

c. Quantify the wastewater that would be generated by the proposed project.

	Gallons/day	Gallons/year
☐ Non-contact cooling water		
☐ Process water		
☐ Sanitary		
☐ Other -- describe:		
☑ None		

d. What would be the major components of each type of wastewater (e.g., coal fines)? ☑ No wastewater produced

e. Identify the local treatment facility that would receive wastewater from the proposed project.
☑ No discharges to local treatment facility

f. Describe how wastewater would be collected and treated. ☑ No wastewater produced

g. Would any run-off or leachates be produced from storage piles or waste disposal sites? ☑ No ☐ Yes (describe source)

h. Would project require issuance of new or modified water permits to perform project work or site development activities?
☑ No ☐ Yes (describe)

i. Where would wastewater effluents from the proposed project be discharged? ☑ No wastewater produced

j. Would the proposed project be permitted to discharge effluents into an existing body of water?
☑ No ☐ Yes (describe water use and effluent impact)

k. Would a new or modified National Pollutant Discharge Elimination System (NPDES) permit be required?
☑ No ☐ Yes (describe)

l. Would the proposed project adversely affect the quality or movement of groundwater? ☑ No ☐ Yes (describe)

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

m. Would the proposed project require issuance of an Underground Injection Control (UIC) permit?

☑ No ☐ Yes (describe)

n. Would the proposed project be located in or near a wellhead protection area, drinking water protection area, or above a sole source aquifer or underground source of drinking water (USDW)?

☑ No ☐ Yes (describe)

During design, internal environmental reviews would identify such areas, however, the project is not expected to introduce new risks to existing above/below ground sources.

8. Solid and Hazardous Wastes

a. Identify and estimate wastes that would be generated from the project. Solid wastes are defined as any solid, liquid, semi-solid, or contained gaseous material that is discarded, has served its intended purpose, or is a manufacturing or mining by-product (See EPA Municipal Solid Waste and Municipal Solid Waste by State).

	Annual Quantity
☐ **Municipal solid waste (e.g., paper, plastic, etc.)**	
☐ **Coal or coal by-products**	
☑ **Other -- Identify:** Scrap fiber.	Indeterminate
☐ **Hazardous waste – Identify:**	
☐ **None**	

b. Would project require issuance of new or modified solid waste and/or hazardous waste related permits to perform project work activities? ☑ No ☐ Yes (explain)

c. How and where would solid waste disposal be accomplished?

☐ None generated
☐ On-site (identify and describe location)
☑ Off-site (identify location and describe facility and treatment)

Scrap fiber will be returned to our facility for disposal at a licensed disposal facility.

d. How would wastes for disposal be transported?

Not applicable.

e. Describe hazardous wastes that would be generated, treated, handled, or stored under this project. Hazardous waste information can be found at EPA Hazardous Waste website. ☑ None

f. How would hazardous or toxic waste be collected and stored? ☑ None used or produced

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

g. If hazardous wastes would require off-site disposal, have arrangements been made with a certified TSD (Treatment, Storage, and Disposal) facility?

☑ Not required ☐ Arrangements not yet made ☐ Arrangements made with a certified TSD facility (identify)

9. Health/Safety Factors

a. Identify hazardous or toxic materials that would be used in the proposed project.

☑ None ☐ Hazardous or toxic materials that would be used (identify):

b. Describe the potential impacts of this project's hazardous materials on human health and the environment.

☑ None

c. Would there be any special physical hazards or health risks associated with the project? ☑ No ☐ Yes (describe)

d. Does a worker safety program exist at the location of the proposed project? ☐ No ☑ Yes (describe)

Current Health & Safety policies and procedures will be implemented during all phases of the proposed project.

e. Would additional safety training be necessary for any new laboratory, equipment, or processes involved with the project?

☑ No ☐ Yes (describe)

f. Describe any increases in ambient noise levels to the public from construction and operational activities.

☑ None ☐ Increase in ambient noise level (describe)

g. Would project construction result in the removal of natural or other barriers that act as noise screens?

☑ No construction planned ☐ No ☐ Yes (describe)

h. Would hearing protection be required for workers? ☐ No ☑ Yes (describe)

If needed, as dictated by current Health & Safety policies and procedures.

10. Environmental Restoration and/or Waste Management

a. Would the proposed project include CERCLA removals or similar actions under RCRA or other authorities?

☑ No ☐ Yes (describe)

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ENVIRONMENTAL QUESTIONNAIRE

b. Would the proposed project include siting, construction, and operation of temporary pilot-scale waste collection and treatment facilities or pilot-scale waste stabilization and containment facilities? ☑ No ☐ Yes (describe)

c. Would the proposed project involve operations of environmental monitoring and control systems?
☑ No ☐ Yes (describe)

d. Would the proposed project involve siting, construction, operation, or decommissioning of a facility for storing packaged hazardous waste for 90 days or less? ☑ No ☐ Yes (describe)

E. REGULATORY COMPLIANCE

1. For the following laws, describe any existing permits, new or modified permits, manifests, responsible authorities or agencies, contacts, etc., that would be required for the proposed project

a. Resource Conservation and Recovery Act (RCRA): ☑ None ☐ New Required ☐ Modification Required
Describe:

b. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):
☑ None ☐ New Required ☐ Modification Required
Describe:

c. Toxic Substance Control Act (TSCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

d. Clean Water Act (CWA): ☑ None ☐ New Required ☐ Modification Required
Describe:

e. Underground Storage Tank Control Program (UST): ☑ None ☐ New Required ☐ Modification Required
Describe:

f. Underground Injection Control Program (UIC): ☑ None ☐ New Required ☐ Modification Required
Describe:

g. Clean Air Act (CAA): ☑ None ☐ New Required ☐ Modification Required
Describe:

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

h. Endangered Species Act (ESA): ☑ None ☐ New Required ☐ Modification Required
Describe:

i. Floodplains and Wetlands Regulations: ☑ None ☐ New Required ☐ Modification Required
Describe:

j. Fish and Wildlife Coordination Act (FWCA): ☑ None ☐ New Required ☐ Modification Required
Describe:

k. National Historic Preservation Act (NHPA): ☑ None ☐ New Required ☐ Modification Required
Describe:

l. Coastal Zone Management Act (CZMA): ☑ None ☐ New Required ☐ Modification Required
Describe:

2. Identify any other environmental laws and regulations (Federal, state, and local) for which compliance would be necessary for this project, and describe the permits, manifests, and contacts that would be required.

None. All work will be performed under existing exemptions.

F. DESCRIBE ANY ISSUES THAT WOULD GENERATE PUBLIC CONTROVERSY REGARDING THE PROPOSED PROJECT. ☑ None

G. WOULD THE PROPOSED PROJECT PRODUCE ADDITIONAL DEVELOPMENT, OR ARE OTHER MAJOR DEVELOPMENTS PLANNED OR UNDERWAY, IN THE PROJECT AREA?

☑ No ☐ Yes (describe)

H. SUMMARIZE THE SIGNIFICANT IMPACTS THAT WOULD RESULT FROM THE PROPOSED PROJECT.

☑ None (provide supporting detail) ☐ Significant impacts (describe)

There are no significant impacts anticipated as a result of this project.

U.S. DEPARTMENT OF ENERGY

ENVIRONMENTAL QUESTIONNAIRE

I. PROVIDE A DESCRIPTION OF HOW THE PROJECT WOULD BE DECOMMISSIONED, INCLUDING THE DISPOSITION OF EQUIPMENT AND MATERIALS.

Upon decommissioning, fiber would be returned to our facility in Providence, Rhode Island for disposal at a licensed solid waste facility.

III. CERTIFICATION BY PROPOSER

I hereby certify that the information provided herein is current, accurate, and complete as of the date shown immediately below.

Signature: Kathy Castro Digitally signed by Kathy Castro Date: 2023.03.14 09:15:05 -04'00'

Date (mm/dd/yyyy): 03/14/2023

Typed Name: Kathy Castro

Title: Director of Asset Management and Planning

Organization: Rhode Island Energy

IV. REVIEW AND APPROVAL BY DOE

I hereby certify that I have reviewed the information provided in this questionnaire, have determined that all questions have been appropriately answered, and judge the responses to be consistent with the efforts proposed.

DOE Project Manager

Signature:

Date (mm/dd/yyyy):

Typed Name:

Rhode Island Energy™
a PPL company

KATHY CASTRO

(b) (6) [redacted]

Ms. Castro manages and directs Engineering, Energy Integration Customer, and Control Center teams responsible for analysis, design, system control and project management in the energy industry, specializing in Distribution Power Systems. High achieving in leading critical engineering programs and able to take responsibility and lead multiple teams and a wide range of projects with full accountability.

Education

Graduate Certificate, Power Systems Management — 2006
Worcester Polytechnic Institute

B.S. Electrical Engineering — 1999-2003
Worcester Polytechnic Institute

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present

Director, Engineering and Asset Management

- Responsible for direct management of staff within the System Planning, Field Engineering, Substation Engineering, Communication, Control Center, Customer Energy Integration and Regulatory Filing teams
- Manage, mentor, and motivate employees, ensuring high performance and exceptional project product quality while meeting aggressive completion dates and budgets.
- Provide specialized technical support and to various areas of the organization including expert witness testimony for regulatory filings and external agency committees and initiatives. Collaborate with electric operation counterparts, legal, regulatory and finance to deliver regulatory filings, work plan, interconnection policies and overall Company strategy to internal and external stakeholders.
- Ensure compliance with DG interconnection tariff and oversee customer disputes, issues and requests.
- Oversee quarterly updates of capital portfolio ensuring optimal management of resources and delivery of plan.
- Responsible for reporting and monitoring Company control center response, reliability and customer DG interconnection performance metrics.
- Directly support and continue development and execution of Grid Modernization Plan including the delivery and validation of advanced control and monitoring devices and systems.

National Grid, Waltham, MA — 2018-2022

Director of Distribution Planning and Asset Management
Director of Complex Customer Project Development
Manager of Distribution Field Engineering

KATHY CASTRO

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Professional Experience, continued

ControlPoint Technologies, Rockland, MA	2011-2018
Director of Engineering	
National Grid, Providence, RI	2003-2010
Senior Network Asset Planning Engineer	
Distribution Engineer	

Software

CYME, ASPEN, PCAmp, Pi Process Book, GIS, Utility SCADA Systems, PSLF, Microsoft Office Suite (Word, Excel, PowerPoint)

Professional Development

Coaching for Performance Course	2021
Emotional Intelligence Course, GP Strategies	2021
Accelerated Development Program, National Grid	2021
Women's Leadership in Energy Conference, EUCI	2020
Northeast Energy and Commerce Association, Renewable Energy Conference	2013
Success Enterprise (SE) Estimation, NGrid Estimating Center of Excellence	2013
Renewable Energy Course, IEEE	2012
Interconnecting Distributed Generation to the Power System, ECNE	2012
ARC GIS Training, ESRI	2009
Low Voltage Secondary Network Course, Siemens Power	2007
Utility Finance and Accounting, Financial Accounting Institute	2006
A Key to Powerful Communication	2003
Power Distribution Engineering Workshop, Synergetic Design Inc	2003

Professional Service

Northeast Public Power Association, Interconnection of Distributed Resources	2013, 2016
Municipal Electric Utilities Association of New York State, Interconnection of Distributed Resources	2017
Energy Council of the Northeast, Distributed Generation Seminar	2013

Highlights

Created, trained, directed and supported a department providing specialized technical review and support for detailed Utility Interconnection and Planning Studies.
Technical sponsor and regulatory witness for Narragansett Electric Infrastructure Safety and Reliability Capital plan.
Created, trained, and directed early-stage engineering and development of large-scale Electric Generation and Natural Gas Transmission and Distribution Customer projects.

JAMES CONRAD

(b) (6)

Mr. Conrad is a skilled, motivated, and highly technical engineer and supervisor with over a decade of experience in a diverse set of problems and disciplines for the commercial, government, and utility industries in companies ranging from eight employees to 140,000. In his current role, Mr. Conrad provides leadership and guidance to several IT product areas and manages a productive team of engineers.

Education

M.Eng. Systems Engineering — 2008-2010
Penn State University

B.S. Electrical Engineering — 2001-2005
Penn State University

Professional Experience

PPL Services Corporation, Allentown, PA — 2022-present

Director, IT Management Product Portfolio — 2022-present

- Directs IT Product areas including Asset Management, Electric Operations, and Gas Operations
- Focused efforts on successful integration of Rhode Island Energy into the PPL Enterprise

PPL Electric Utilities, Allentown, PA — 2016-2022

Director, Distribution Operations — 2021-2022

- Directs PPL's Distribution Control Center, DCC Engineering & DER Management, and Respond to Customer (first responder) departments.
- Leads PPL's future-leaning strategic Smart Delivery initiative.
- Reports to VP of Distribution Operations

Manager, Distribution Operations — 2020-2021

- Responsible for oversight of PPL's Distribution Control Center
- Supervising Engineer

Manager, Relay Test — 2018-2020

- Responsible for the management of a department of Supervisors, Engineers, and Relay Technicians across all service territories at PPL Electric Utilities

Supervisor, Distribution Standards — 2016-2018

- Responsible for maintaining and creating Construction Specifications and Engineering Instructions, evaluating new equipment for use on the PPL system, investigating equipment failures and trends, and providing guidance to field personnel.
- Responsible for overseeing a group of 10 engineers and approving Distribution Construction Specifications and Engineering Instructions for PPL Electric Utilities.

Senior Engineer — 2016

- Served as subject matter expert for Distribution Sectionalizing and Smart Grid devices within the Distribution Standards group at PPL Electric Utilities.

CHRIS RANDLE

(b) (6)

Mr. Randle has more than 20 years of experience in cybersecurity, creating and executing strategies that protect Fortune 500 companies from advanced cyber threat activity. In his current role, he is responsible for the cyber safety of all PPL operating companies, including RIE. He has a unique ability to understand the people in an environment and how to leverage their talents to achieve objectives.

Education

M.B.A. Business Administration — 2008
Webster University

M.I.S. Computer Science — 2000
The University of Alabama

Professional Experience

PPL Services Corporation, Allentown, PA — 2019-present
Vice President, Cybersecurity

- Fortune 500 Energy company serving customers in PA, KY and RI
- Implemented an advanced cyber awareness and training program that resulted in a significant improvement in user behavior regarding phishing emails
- Improved the cybersecurity program to achieve NIST CSF maturity above 3 in most areas of cybersecurity
- Eliminated long-standing compliance issues and structured a compliance program to ensure cyber success for cyber and IT
- Successfully hired leadership and technical talent which has further ensured maturity and forward progress for cyber safety
- Established executive governance processes resulting in quality cyber information sharing across business areas
- Established an embedded cyber function within product portfolios that results in development of secure products

Verisign, Reston, VA — 2017-2019
Director, Cyber Ops

Raytheon Foreground Security, Herndon, VA — 2015-2017
Principle Solutions Architect

Freddie Mac, McLean, VA — 2012-2015
Senior Information Security Manager

Certifications

CISSP ISC2 (2003-present)
CISM, Certified Information Security Manager (ISACA 2009-2018)
CRISC, Certified in Risk and Information Systems Control (ISACA 2011-2018)
CISA, Certified Information Systems Auditor (ISACA 2007-2018)

BRIAN GRZESIUK

(b) (6)

Mr. Grzesiuk is a finance professional with superior qualifications in budgeting, forecasting, financial modeling, financial reporting, financial systems, financial analysis, infrastructure, treasury analysis, and valuation analysis. In his current role, Mr. Grzesiuk manages all finances related to Rhode Island Energy's annual capital investment plan, including financial reporting and reconciliation.

Education

M.S.F. Finance — 2014
Suffolk University
Magna Cum Laude (graduated first overall)

B.S. Accounting, Minor in Finance — 2013
Suffolk University

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Senior Finance Manager

- Responsible for budgeting and forecasting for operating and capital expenditures, long term business planning, and supporting the strategic, operational, and financial decision making for Electric Operations
- Other responsibilities include risk management, data analytics, accounting, and financial reporting

National Grid, Waltham, MA — 2017-2022
Finance Manager and Business Partner — 2018-2022

- Financial lead for a company-wide capex/opex 20% efficiency initiative
- Responsible for budgeting, forecasting, and delivering a $1 billion dollar per year investment portfolio
- Review the commerciality of critical decision making while providing strategic guidance and validation of baselines and delegation of authority for sourcing activities

Senior Financial Analyst — 2017-2018

- Finance lead for large construction projects; Created reporting for executive leadership that included Financial Performance and Strategic KPI's; Performed treasury analyses that assessed liquidity, gearing, and financing opportunities; Negotiated business terms and provided valuations for multiple businesses and potential acquisitions

Medtronic — 2015-2017
Senior Financial Analyst

Skills

Excel, PowerPoint, SAP – Highly skilled with the ability to operate complex models
Chartered Global Management Accountant (CGMA)

CARRIE A. GILL, Ph.D.

(b) (6)

Dr. Gill is a recognized thought leader with 15 years of experience in energy and climate, spanning academic, industry, and public service. She currently leads electric regulatory strategy for Rhode Island Energy. In her previous role, she led energy and climate policy strategy for the State of Rhode Island. Dr. Gill's skills include facilitation, public communications, teaching, and coaching.

Education

Ph.D.	Environmental and Natural Resource Economics	2012-2017
	University of Rhode Island, College of the Environment and Life Sciences, Kingston, RI	
	Dissertation: "Encouraging Energy Efficiency: Pricing, Framing, and Education"	
	Greg Lessne Award for Excellence (2018)	
	John M. Gates Memorial Scholar (2013-2015)	
	Thomas F. Weaver Award (2013)	
M.B.A.	Business Administration	2009-2010
	University of Rhode Island, College of Business Administration, Kingston, RI	
M.O.	Oceanography	2009-2010
	University of Rhode Island, Graduate School of Oceanography, Narragansett, RI	
B.S.	Physics and Mathematics	2003-2007
	Loyola University, Baltimore, MD	
	Summa Cum Laude	

Professional Experience

Rhode Island Energy, Providence, RI		2022-present
	Senior Manager, Electric Regulatory Strategy	
Rhode Island Office of Energy Resources, Providence, RI		2017-2022
	Chief Economic and Policy Analyst	2021-2022
	Administrator, Grid Modernization and Systems Integration	2020-2021
	Chief, Program Development	2018-2020
	Program Services Officer	2017-2018
University of Rhode Island, Kingston, RI		2010-2019
	Instructor, Strategic Innovation MBA528: Economics	2019
	Technical Support for RI Efficient Buildings Fund	2016-2017
	Grad Student Representative, President's Council on Sustainability	2015-2017
	Grad Research Assistant, Environmental & Natural Resource Economics	2013-2017
	Grad Teaching Assistant	2012-2013
	Grad Research Assistant, Coastal Resources Center	2010
Nextility (formerly Skyline Innovations), Washington, DC		2012
	Data Analyst	
	Gill, Carrie. "Analysis of Energy Generation from Solar Thermal Panels." Nextility, technical report (2012).	

CARRIE A. GILL, Ph.D.

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Professional Experience, continued

U.S. Department of Energy, Washington, DC 2011-2012
Energy Efficiency and Renewable Energy, Office of Wind and Water Power
Dean John A. Knauss Sea Grant Fellow

Publications

Ross, Sam, Becca Trietch, and **Carrie Gill** "Benefit-Cost Analysis of Non-Wires Alternatives: Reflecting Uncertainty in Electric Distribution System Planning" American Council for an Energy-Efficient Economy Summer Study (2022)

Gill, Carrie, et al. "Use of Operating Agreements and Energy Storage to Reduce Photovoltaic Interconnection Costs: Conceptual Framework" National Renewable Energy Laboratory (2022)

Gill, Carrie, Stephen Atlas, and David Hardisty, "Matching Costs to Context: Status Quo Bias, Temporal Framing, and Household Energy Decisions" *Journal of Consumer Behaviour* (2022)

Gill, Carrie and Corey Lang, "Learn to Conserve? The effects of in-school energy education on household electricity consumption" *Energy Policy* (2018)

Pearson-Merkowitz, Shanna, **Carrie Gill**, and Corey Lang, "Policy Entrepreneurs after Policy Success and Failure Evidence from open space referendums" *Electoral Studies* (in review)

Gill, Carrie and Corey Lang, "Price and Punishment: Evidence from mandatory residential time-of-use electricity pricing" (working paper)

Gill, Carrie and Corey Lang. "Are Fulbright Applicants Idealists or Opportunists?" *Eastern Economic Journal* (2014)

Elliot, Dennis et al. "Offshore Resource Assessment and Design Conditions: A Data Requirements and Gaps Analysis for Offshore Renewable Energy Systems." U.S. Department of Energy Wind and Water Power Program, report (2012).

Professional Service

Executive Climate Change Coordinating Council (EC4) Official designee for Department of Administration Director Thorsen	2021-2022
Chair, Green Buildings Advisory Committee	2021-2022
Member, Statewide Planning Technical Committee	2018-2022
Rhode Island COVID Response Project Manager for Health and Human Services Team	Spring 2020

Awards and Honors

Greg Lessne Award for Excellence for PhD Dissertation	2018
Precourt Fellow, Behavior, Energy, and Climate Change Conference	2016
John M. Gates Memorial Scholar, University of Rhode Island	2013-2015
Thomas F. Weaver Award, University of Rhode Island	2013
Dean John A. Knauss Marine Policy Fellow, Rhode Island Sea Grant and NOAA	2011

RYAN CONSTABLE

(b) (6)

Mr. Constable has more than 25 years of power engineering experience covering a broad spectrum of engineering, management, planning, design, and operational issues, including the installation of submarine transmission cables and long-range capacity planning. At Rhode Island Energy, Mr. Constable was the lead engineer in development of the company's grid modernization plan.

Education

Graduate Certificate, Power Systems Management — 2000
Worcester Polytechnic Institute

B.S. Electrical Power Engineering, Minor in Economics — 1993
Rensselaer Polytechnic Institute

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Manager, Distribution Planning

- Plans and initiates electric infrastructure to provide safe, efficient, and reliable electric service throughout Rhode Island
- Strategic company efforts towards electric grid modernization and clean energy initiatives
- Leads a 10-person team that completed a state-wide analysis using novel load cycle and distributed energy resource modelling techniques that tied state emissions data to specific power and energy usage across four hundred distribution circuits

National Grid, Waltham, MA — 2012-2022
Manager, Distribution Planning

- Led distribution system planning, including electric infrastructure investment planning, grid modernization, DER interconnection
- Focused on Rhode Island and Central and Western Massachusetts
- Led his team in advancements in interconnection modelling for energy storage, so energy storage could be used to lessen interconnection costs for all DER
- Part of a management team that re-established a comprehensive area study process to Distribution Planning, tackling long standing complex issues on the electric system and led to major system improvements that would otherwise not have happened

Brookfield Renewable Power Company — 2007-2012
Lead Engineer

- Led engineering of transmission system development for the Texas Competitive Renewable Energy Zone (CREZ) effort to enable over 18 gigawatts wind generation in West Texas
- Lead engineer and project manager for the CREZ proposal and successful bid to build $500 (7 transmission lines and 5 substations), helping establish a new utility in Texas

RYAN CONSTABLE

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Professional Experience, continued

Cross Sound Cable Company and TransEnergie U.S. 2000-2007

Senior Engineer

- Permitting, construction, and operation of the Cross Sound Cable Project, an industry leading 24-mile merchant transmission cable installed between Connecticut (ISO-NE) and Long Island, NY (NYISO)
- Assisted in the siting and permitting process and commercial and technical aspects of the Engineer, Procure, and Construct (EPC) contract, as well as numerous other aspects of the project, including contract development and administration of the horizontal directional drill installation, oversight of the submarine cable installation, development and implementation of construction and operational environmental management and spill prevention plans, proactive development of emergency cable repair plans and contracts, and contract development and administration of cable reburial work
- Operator and on-call responder providing technical support for all O&M efforts including fault response, diagnosis, repair, records maintenance and reporting; resolving interface issues with the main circuit, revenue metering, telecommunications, and control and protection systems; and maintenance of operating and fault and asset records and databases

Massachusetts Electric Company 1994-2000

Planning Engineer and Project Manager

- Responsible for numerous major regional Distribution Studies, each of which included long-range transmission and distribution capacity, short circuit, power factor, reliability, environmental, and economic analysis and recommendations
- Operations engineer responsible for the design, maintenance, and power quality of the electric infrastructures serving commercial and residential customers throughout southeast Massachusetts
- Control authority and on-call supervisor analyzing restoration system databases and directing crews during electric system restoration efforts

Professional Affiliations

Registered Professional Engineer in the Commonwealth of Massachusetts
IEEE Member

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DANIEL GLENNING

(b) (6)

Mr. Glenning is an experienced leader with four decades of experience in project management and engineering. He leads a diverse team of professionals by setting the vision, and strategy that support Rhode Island Energy's goal of building one of the nation's most advanced energy grids in support the state's decarbonization goals, improving system reliability, and providing value for Rhode Island communities.

Education

Certificate, Advanced Acquisition Program — 2006
Naval Post-Graduate School

B.S. Mechanical Engineering — 1983
Clarkson University

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Director, Project and Construction Management

- Accountable for the Rhode Island Energy portfolio of complex projects
- Leads a diverse team of professionals consisting of Project Managers, Project Controls, Construction Managers, Stakeholder Managements, and Permitting professionals

National Grid, Waltham, MA — 2007-2022
Director, Gas Project Management — 2018-2022

- Responsible for mentoring and training the Gas Project Management Team
- Accountable for delivering the annual gas complex work plan
- Implemented new Capital Delivery Process
- Collaborated across departments to ensure projects set up to achieve all objectives
- Established annual goals to reinforce and improve gas project ownership and accountability
- Implemented standard gas project reporting processes
- Implement new strategies to reduce cost and improve delivery

Vice President, System Development and Complex Construction — 2017-2018

- Gas and Electric System Development and Complex Construction Process Owner (~$1.5B of annual expenditures)
- Led process teams by setting vision, strategy and goals for our end-to-end process improvements
- Established Key Performance Indicators (KPIs) to monitor process health and develop improvement strategies
- Implemented process improvement initiatives which resulted in a ~20% reduction in engineering/permitting cycle time
- Ran Project Management Office (PMO) that improved ROI by managing a portfolio that was projected deliver a ~$90M OPEX reduction by the end of FY19

DANIEL GLENNING

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Professional Experience, continued

National Grid, Waltham, MA 2007-2022

Director, Work Order Remediation 2016-2017

- Ran Project Management Office (PMO) that oversaw sixteen teams that solved thirty-six unique system issues
- Led a special project team that resolved system issues that prevented automatic closure of work orders; Developed strategies that cleared a $3.5 billion backlog of open work orders; Developed a work order root cause analysis for all Lines of Business (Gas, Electric, and Generation); Established KPIs to monitor work order lifecycle health and ensure system fixes allows work orders to close

Director, Complex Electric Project Management 2010-2016

- Accountable for delivering an annual $700M work plan; Led a team of approximately fifty Project Managers and Community Outreach Specialists, who were responsible for delivery of all complex electric projects across our service territory
- Collaborated with other departments to ensure projects were set up to achieve all objectives; Established annual goals to reinforce and improve project ownership and accountability; Implemented standard electric and gas project management processes and procedures; Established standard project progress reporting; Implemented new procurement strategies to reduce cost, improve project delivery
- Project types include interconnection of the first offshore wind farm, new overhead and underground 115 and 345 kV transmission lines/substations, as well as refurbishment of existing assets

Manager, Substation Project Management 2008-2010

- Accountable for delivering the annual $125M substation work plan

Transmission Project Manager 2007-2008

- Collaborated on a helicopter construction strategy, which resulted in an immediate $2M cost savings

Naval Undersea Warfare Center 1983-2007

Lead Program Manager, Submarine System Product Area 2005-2007
Project Manager for In-Service and Advanced Development Projects 2003-2005
Project/Engineering Manager 1992-2003
Various Project and Engineering Positions 1983-1992

Community Involvement

Newport County YMCA Board of Directors
Newport County Special Olympics Team Coach, Unified Player, and Booster Club Member
Rhode Island District 2 Challenger Baseball Coach
Knights of Columbus - Middletown/Newport Council #256

NICOLE BEGNAL

(b) (6)

Ms. Begnal is an energy professional passionate about project and program management. She is skilled at coordinating across diverse teams, maintaining organized records, managing complex processes, and communicating effectively and efficiently. In her current role, Ms. Begnal manages administration of electric distribution infrastructure planning, including annual electric infrastructure, safety, and reliability planning.

Education

M.B.A. Business Administration — 2019-2021
College of William and Mary
Raymond A. Mason School of Business

B.S. Business Administration — 2013-2017
University of South Carolina, Columbia, SC
Majors: International Business, Finance, Risk Management and Insurance
Minor: Japanese
Freeman Scholar Recipient — 2016
Kakehashi Project Participant — 2015
McKissick Scholar — 2013

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Manager, Electric Infrastructure, Safety, and Reliability
- Responsible for five-year electric distribution investment plan
- Regulatory witness for annual electric infrastructure, safety, and reliability plan
- Coordinates across teams of planners, engineers, legal, regulatory strategy, and external affairs
- Manages company responses to all data requests, information requests, record requests, and other regulatory inquiries

Goulston & Storrs, Boston, MA — 2021-2022
PMO Specialist
- Responsible for implementing project management processes and control for projects within the firm

National Grid, Waltham, MA — 2017-2021
Project Manager — 2018-2021
- Managed execution of natural gas construction project portfolio

Associate Project Manager — 2017-2018
- Assisted with execution of natural gas construction projects and project management reporting

Training

Project Management Professional (PMP) Certification — 2022
Project Management Institute

KATE GRANT

(b) (6)

Ms. Grant is an experienced leader in regulatory, state, and external stakeholder relations. Over her 25-year career, Ms. Grant has adeptly directed regulatory and state affairs pertaining to decarbonization, climate policy, renewable energy, energy efficiency, grid modernization and smart grid, advanced metering, utility infrastructure planning, customer assistance, and other utility interests spanning electric and gas.

Education

M.E.M. Environmental Management — 2000
Duke University
Environmental Toxicology, Chemistry and Risk Assessment
Research grant awarded via the Duke Marine Biomedical Center

B.A. Environmental, Economics, and Politics (EEP) — 1997
Claremont McKenna College
Keck Grant Recipient — 1996

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Senior Manager, Regulatory Affairs

- Serves as the key regulatory liaison to Rhode Island based regulators as well as advise the incoming leadership team on regulatory matters in line with the Company vision and goals to achieve financial and policy outcomes in line with customer priorities and delivering value
- Currently leading stakeholder engagement and advising leadership on key priorities inclusive of advanced metering and grid modernization efforts, customer assistance initiatives responsive to current rate pressures as well as demand side initiatives in part via a governor appointed role on Rhode Island's Energy Efficiency and Resource Management Council (EERMC)

National Grid, Waltham, MA — 2016-2022
Regulatory Affairs Director, New England — 2021-2022

- Oversaw regulatory matters in National Grid's New England jurisdictions serving as the key liaison to Rhode island base regulators and supervising the Massachusetts based teams
- Led and managed regulatory engagement on complex regulatory matters such as long-term solutions for the Aquidneck Island gas capacity constraint, customer affordability initiatives and clean energy proposals
- Advised on regulatory considerations associated with new policy positions, products or services

Regulatory Affairs Manager, Rhode Island — 2018-2021

- Serve as the key liaison, relationship manager and stakeholder engagement lead to Rhode Island state agencies

KATE GRANT

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Professional Experience, continued

National Grid, Waltham, MA — 2007-2022

Regulatory Affairs Manager, Rhode Island (continued) — 2018-2021

- Through strong performance and responsiveness to regulators needs, built strong relationships amongst leadership at all three leading agencies as a trusted partner and problem solver
- Advocated for additional transparency and engagement on PIMs; progressed high level conversations on issues related to affordability, low-income program design, gas reliability, decarbonization and operational matters
- Offer regulatory strategic insight, advice, and advocacy support via strong collaborative partnerships among internal teams to ensure cross business integration of proposals as well as heightened chance of success externally

Principle Specialist, Stakeholder Engagement — 2016-2018

- Led regulatory engagement on 9 separate Reforming the Energy Vision (REV) related demonstrations in New York, testing emerging business models as well as the AMI business case and others

Consortium for Energy Efficiency, Boston, MA — 2014-2016

Principle Program Manager, Commercial Sector

- Oversaw team responsible for advancing commercial sector energy saving opportunities through strategic initiatives focused on accelerating market uptake of energy efficient equipment and systems
- Co-chaired whole building, commercial lighting and data center committees comprised of US and Canadian energy efficiency program administrators in support of advancing efficiency program goals, building consensus around technology solutions gaining support of key manufacturer stakeholders

Pacific Gas and Electric Company (PG&E), San Francisco, CA — 2007-2014

Director, Regulatory Relations, Electric Operations — 2012-2014

- Regulatory lead and advocate for research, development and deployment (RD&D) proposals focused on furthering smart grid, renewable integration, electric vehicle and electric reliability technologies.
- Obtained approval of high potential smart grid pilots with a budget of $80 million; led negotiations with intervenors resulting in significant streamlining of significant RD&D proceeding

Director/Manager, State Agency Relations, Climate Change — 2009-2012

Regulatory Manager, Regulatory Relations — 2007-2009

Renewables Proceeding Team Leader and Case Manager — 2007

Volunteer and Community Initiatives

Rhode Island Energy Efficiency and Resource Management Council — 2022-present
Nominated by Governor Dan McKee and approved via Senate Consent

Leadership Rhode Island — 2022

ERICA RUSSELL SALK, PE

(b) (6)

Ms. Russell Salk has over a decade of engineering and management experience. In her current role, she manages the team of professionals that liaise between interconnecting customers and interconnection engineers, is an expert on Rhode Island Energy's interconnection tariff, and manages regulatory, policy, and business considerations in administering net metering and feed-in-tariff renewable energy programs.

Education

Graduate Certificate, Power Systems Engineering — 2015
Worcester Polytechnic Institute

M.S. Engineering, Concentration in Electrical Engineering — 2012
Brown University

B.S. Engineering, Concentration in Electrical Engineering — 2011
Trinity College
Completed one year at Thayer School of Engineering at Dartmouth College as part of 12 College Exchange Program (2009-2010)

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Manager, Customer Energy Integration (CEI)

- Responsible for oversight of the CEI team, which supports all customer interconnection applications and shepherds them through the interconnection process
- Coordinate with all internal stakeholder teams necessary to interconnect customer distributed generation to the Utility distribution system
- Lead external stakeholder engagement with customers, developers, regulatory bodies (Public Utilities Commission, Division of Public Utilities and Carriers, Office of Energy Resources, etc.)
- Internal subject matter expert on Rhode Island statutes and tariffs pertaining to DG interconnection and incentive programs (Net Metering, RE Growth)
- Participate in regulatory proceedings (technical sessions, open meetings, hearings, etc.) to drive change (process, legislative, etc.) and resolution to outstanding issues, in collaboration with Regulatory Strategy team

National Grid, Waltham, MA — 2019-2022
Engineering Manager, Protection Policy & Support and IEC 61850

- Responsible for the IEC 61850 team in Syracuse, NY and Lincoln, RI
- Managed two R&D labs (Syracuse, NY and Lincoln, RI) and a group of six internal engineers and 12+ contractors
- Responsible for standards development and capital delivery support for National Grid's first IEC 61850 projects and the first utility in North America to implement Process Bus

ERICA RUSSELL SALK, PE

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Professional Experience, continued

National Grid, Waltham, MA 2019-2022

Engineering Manager (continued)

- Development of 90+ new standards leveraging 61850 industry standards, conventional substation design standards, and lab R&D
- Engagement with leading industry vendors to influence product roadmaps for optimal design
- Support knowledge transfer and training of key stakeholder teams; Engineering, Field Operations, etc.
- Support the Capital Plan; review Protection and C&I design briefs, collaborate with designers on prints, support Outage Coordinators, fully configure and test digital devices for field implementation and support the field on commissioning
- Collaborate with National Grid UK and other utilities to facilitate knowledge sharing
- Chairman Award Recipient in 2020: Leading the Future of Energy in Digital Substations; Growing our organizational capabilities
- Protection Policy & Support team for New England; group of four engineers
- Responsible for compliance in line with regulatory bodies; NERC CIP and PRC standards
- Responsible for disturbance analysis for any operation on the Transmission system
- Responsible for standards development in support of compliance requirements and National Grid Protection Philosophy

Supervisor, Protection Operations 2019

- Responsible for daily supervision, organization, and work schedule of field staff to safely and efficiently accomplish tasks
- Ensure successful delivery of project scope/schedule/budget, and oversee day-to-day work, planned and trouble testing, witness testing, etc.
- Participate in system disturbances and Incident Analysis (IA)

Technical Advisor to the US Chief Electric Engineer, Electric Business Unit 2018-2019

Senior Engineer, Protection Engineering New England 2013-2018

- "The Optimal Selection of OPGW Based on Fault Current" By Song Ji, Dan Markis, Erica Russell Salk, Mark Stevens, National Grid USA

Parsons Corporation, Boston, MA 2013

Associate Electrical Engineer, Parsons Environment and Infrastructure

CG Power Solutions, Riverside, RI 2012

Electrical Engineering Graduate Intern, Substation Engineering

Affiliations

IEEE member, PES Boston Member 2016-present

Licenses

Professional Electrical Engineer – Rhode Island #11883 2016-present

BETHANY JOHNSON

(b) (6)

Ms. Johnson has two decades of experience with PPL affiliate companies, with expertise in regulatory strategy, regulatory operations, regulatory affairs, and ratemaking. Ms. Johnson currently leads a team of regulatory and rates analysts supporting operating companies in Rhode Island and Pennsylvania. Ms. Johnson also has tremendous experience being an expert witness in regulatory proceedings.

Education

M.B.A. Business Administration — 2001-2003
Moravian College

B.S. Finance, Minor Concentration in Business Administration — 1996-1999
King's College

Professional Experience

PPL Corporation Affiliates, Allentown, PA — 2003-present

Director, Regulatory Affairs (PPL Services Corporation) — 2022-present

- Responsible for leadership and direction to ensure attainment of business goals and objectives with regard to energy and utility policy, company strategy, procurement of electric wholesale generation supply, distribution rate design and administration, general tariff administration, and cost of service implementation
- Responsible for transmission FERC Formula Rates, development of rate case strategies & processes, regulatory compliance filings submitted to the Pennsylvania Public Utility Commission (PUC), Rhode Island PUC and Division of Public Utilities and Carriers, and FERC
- Responsible for PUC communications and Petitions filed before the PUC.
- Provided testimony in formal PUC cases (rate cases, customer/rate complaints, company petitions)
- Other responsibilities include developing legislation, and development of load and revenue forecasting and analysis for PPL Electric (approx. $2B/yr) and Rhode Island Energy

Director, Regulatory Affairs (PPL Electric Utilities Services Corporation) — 2020-2022

- Responsible for leadership and direction to ensure attainment of business goals and objectives with regard to: energy and utility policy, company strategy, procurement of wholesale generation supply, distribution rate design and administration, general tariff administration, and cost of service implementation, as well as transmission FERC Formula Rates, development of rate case strategies & processes, regulatory compliance filings submitted to the Pennsylvania Public Utility Commission and Federal Energy Regulatory Commission.
- Responsible for PUC communications and Petitions filed before the PUC. Provided testimony in formal PUC cases (rate cases, customer/rate complaints, company petitions)

BETHANY JOHNSON

Professional Experience, continued

PPL Corporation Affiliates, Allentown, PA — 2003-present

Manager, Regulatory Operations (PPL Electric Utilities Corporation) — 2015-2020

- Responsible for leadership and direction to ensure attainment of business goals and objectives with regard to: energy and utility policy, company strategy, procurement of wholesale generation supply, distribution rate design and administration, general tariff administration, and cost of service implementation, as well as transmission FERC Formula Rates, development of rate case strategies & processes, regulatory compliance filings submitted to the Pennsylvania Public Utility Commission and Federal Energy Regulatory Commission
- Responsible for PUC communications and Petitions filed before the PUC
- Provided testimony in formal PUC cases (rate cases, customer/rate complaints, company petitions)

Manager, Regulatory Compliance (PPL Electric Utilities Corporation) — 2012-2015

- Responsible for PPL Electric's compliance with the regulatory requirements of the Pennsylvania Public Utility Commission, the Federal Energy Regulatory Commission, and other regulatory agencies, as necessary
- Responsible for the preparation and review, and technical oversight and guidance of the development, content, and structure of cost allocation and revenue requirement studies; all aspects of the Company's rates and tariffs
- Provide expert testimony in these and other cost-of-service and ratemaking-related matters
- Present regulatory proposals, policies, strategies, and approaches to leadership that are consistent with the overall business and financial strategies
- Maintain strong and constructive relationships with regulatory Commission staff in the execution of regulatory compliance and ratemaking duties

Financial Business Planning Specialist — 2009-2012

- Responsible for complex activities associated with the analysis of cost-of-service related information and the preparation of distribution and transmission rate cases, including preparing testimony
- Prepare analysis and justification for senior management to determine the need and magnitude of potential distribution rate filings, maintain transmission and distribution cost-of-service information on an ongoing basis for quarterly reports to the PUC and FERC formula transmission rate, provide rate case related information for budget preparation, forecasts, variance analysis, and conduct ongoing analysis and research of other ratemaking proceedings before the PUC and FERC

Project Controls Specialist (PPL Electric Utilities Corporation) — 2009

Business Analyst (PPL Energy Services Group, LLC) — 2007-2008

Senior Business Anlyst (PPL Global, LLC) — 2004-2007

Project Controls Analyst (PPL Generation, LLC) — 2001-2004

Accountant (PPL Global Operations, LLC) — 2000-2001

ANGIE EVANS

(b) (6)

Ms. Evans has over 25 years of experience holding leadership positions in both the public and private sectors. In her current role as Vice President, Chief Diversity, Equity and Inclusion Officer for PPL Corporation, Ms. Evans leads strategy and implementation for advancing PPL's enterprise-wide diversity, equity, and inclusion strategy and commitments. Ms. Evans' experience demonstrates her commitment to DEI and community.

Education

J.D. Juris Doctor 1991-1994
University of Kentucky

B.A. English 1987-1991
Centre College

Professional Experience

PPL Corporation, Allentown, PA 2022-present
Vice President, Chief Diversity, Equity, and Inclusion Officer
- Responsible for advancing PPL's enterprise-wide diversity, equity, and inclusion strategy and commitments

LG&E and KU Energy, LLC, Louisville, KY 2015-2022
Vice President, Corporate Responsibility 2018-2022
- Led community engagements and investments
- Oversaw key corporate responsibility programs and grant-making processes

Director, Corporate Responsibility and Community Affairs 2017-2018
Manager, Corporate Responsibility 2015-2016
- Provide key support in developing and accomplishing the company's corporate responsibility (CR) strategies by managing community relationships, community investment and involvement, important CR programs and the LG&E and KU Foundation's grant-making process

Community Foundation of Louisville, Louisville, KY 2012-2014
Vice President, Community Leadership

University of Louisville, Louisville, KY 2010-2011
Director, Planned Giving

National City Bank (now PNC), Louisville, KY 2002-2010
Vice President, Private Banking Advisor

Service, Affiliations, and Awards

Centre College Board of Trustees; Boards of directors for Actors Theatre, American Printing House for the Blind, Bates Community Development Corporation, Community Foundation of Louisville, and the James Graham Brown Foundation

Woman of Distinction, Center for Women and Families (2020)

"Tough Cookie Award," Girl Scouts of Kentuckiana

DAVID J. BONENBERGER

(b) (6)

Mr. Bonenberger is president of Rhode Island Energy, the largest electricity transmission and distribution and gas distribution provider in Rhode Island, serving more than 770,000 customers in 38 cities and towns. With over four decades of utility industry experience, Mr. Bonenberger oversees all operations of Rhode Island Energy and he is a key leader in the PPL organization.

Education

M.B.A. Business Administration
Wilkes University

B.A. Accounting
Bloomsburg University of Pennsylvania

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
President
- Oversees electricity transmission and delivery and delivery of gas and customer service
- Leads efforts to invest in infrastructure and technology to improve reliability, enable clean energy, allow for a safe and efficient response during storms and improve service to customers

PPL Corporation, Allentown, PA — 2021-2022
Vice President, Operations Integration
- Primarily responsible for the successful operational integration of the Narragansett Electric Company acquisition into PPL, including creation of transition/integration strategy, implementation of change management across multiple stakeholder groups, and achievement of acquisition business case revenue and pre-tax income

PPL Electric Utilities, Allentown, PA — 1984-2021
Vice President, Transmission and Substations
Vice President, Distribution Operations
Various prior positions in operations, business, customer care, and accounting

Service, Affiliations, and Awards

Edison Electric Institute's Preparedness & Recovery Executive Advisory Committee
Electric Power Research Institute's Transmission Executive Advisory Committee
Southeastern Electric Exchange Executive Engineering and Operations Committee
Association of Edison Illuminating Companies' Power Delivery Committee
Chair Emeritus, EEI National Response Executive Committee
Board of Directors and Executive Committee, Hawk Mountain Sanctuary
Board of Directors, United Way of RI
Board of Directors, Greater Providence Chamber of Commerce

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ALAN LaBARRE

(b) (6)

Mr. LaBarre is an experienced senior leader possessing well developed leadership skills. His strengths include ability to engage, develop, motivate employees, and breaking down complex efforts into well-defined manageable tasks for team members with varying talents and breadth and depth of experience. With 35 years of experience, Mr. LaBarre leads electric operations for Rhode Island Energy.

Education

Certificate, School of Industrial Management — 1995-1999
Worcester Polytechnic Institute

B.S. Electrical Engineering — 1983-1987
University of Rhode Island
Summa Cum Laude

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present
Vice President, Electric Operations — 2023-present
Senior Director, Electric Operations — 2022-2023

- Strategic guidance and leadership for electric operations, planning, and engineering
- Lead the planning teams/efforts that support the establishment and prioritization of the significant and diverse infrastructure development project portfolios of a major electric utility, including multiple successful high-profile efforts that included the expedited planning and implementation of new service delivery/interconnection projects requiring new substations and associated distribution circuits
- Provides expert witness testimony associated with regulatory proceedings
- Led the application of the latest technologies being applied to enhance electric distribution grid performance and operations (distribution automation, Volt/VAR optimization, sensor applications, etc.)
- Support extensive stakeholder engagement

National Grid, Waltham, MA — 2021-2022
Vice President, New England Control Centers — 2021-2022
Director, Distribution Planning and Asset Management, New England — 2013-2021

- Guided planning teams through a phase of unprecedented growth in the interconnection of DER on the electric distribution system
- Support the extensive stakeholder engagement

Manager, Advanced Grid Engineering — 2011-2013
Manager, Power Distribution, MA and RI — 2000-2011
Associate Engineer to Principal Engineer, MA — 1998-2000

Licenses

Professional Engineer – State of Rhode Island

BRIAN SCHUSTER

(b) (6)

Mr. Schuster leads stakeholder engagement and relations for Rhode Island Energy, including community relationship managers, regulatory affairs and strategy, government affairs, and external and internal communications. With over two decades of experience in engagement and engineering, Mr. Schuster advises on all public engagement regarding utility infrastructure, grid modernization, and emerging technologies.

Education

M.B.A. Business Administration — 2000-2022
Worcester Polytechnic Institute

Post-Graduate Education — 1995-1996
Naval Nuclear Power School and Prototype

B.S. Computer Science and Engineering — 1991-1995
University of Notre Dame

Professional Experience

Rhode Island Energy, Providence, RI — 2022-present

Senior Director, External Affairs — 2023-present

Director, External Affairs — 2022-2023

- Responsibility over the management of all public relations and communications between the utility company and Rhode Island's legislative, regulatory, and community stakeholders. Role also includes oversight of all corporate communications, public events, corporate sponsorships, marketing, and giving on behalf of Rhode Island Energy

National Grid, Waltham, MA — 2003-2022

Director, RI Customer and Community Management — 2019-2022

- Directed a team of 7 with oversight of municipal and customer affairs across the state of Rhode Island

Director, New Energy Solutions — 2016-2019

- Developed, optimized, and directed processes for the innovation of new electric and gas solutions and products for the utility industry. Work incorporated certifications in Design Thinking and oversight of team of 30 personnel across New England and New York

Director, Customer Fulfillment — 2008-2016

Manager, Distribution Design, New England South — 2007

Superintendent, Electric Operations — 2005-2007

Supervisor, Distribution Design — 2004-2005

Operations Engineer (Team Leader) — 2003-2004

United States Navy — 1995-2002

Engineer Instructor for Naval Science, College of the Holy Cross — 2000-2002

Navy Nuclear Officer, USS San Francisco (SSN-711) — 1997-1999

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

OMB Number: 4040-0013
Expiration Date: 02/28/2025

1. * Type of Federal Action:
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

2. * Status of Federal Action:
- [x] a. bid/offer/application
- [ ] b. initial award
- [ ] c. post-award

3. * Report Type:
- [x] a. initial filing
- [ ] b. material change

4. Name and Address of Reporting Entity:

[x] Prime [ ] SubAwardee

** Name:* The Narragansett Electric Company d/b/a Rhode Island Energy

** Street 1:* 280 Melrose Street *Street 2:*

** City:* Providence *State:* RI: Rhode Island *Zip:* 02907

Congressional District, if known: RI-001

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency:
Department of Energy

7. * Federal Program Name/Description:
Grid Infrastructure Deployment and Resilience

CFDA Number, *if applicable:* 81.254

8. Federal Action Number, *if known:*
DE-FOA-0002740

9. Award Amount, *if known:*
$

10. a. Name and Address of Lobbying Registrant:

Prefix: ** First Name:* David *Middle Name:*

** Last Name:* Arthur *Suffix:*

(b) (4)

b. Individual Performing Services (including address if different from No. 10a)

Prefix: ** First Name:* David *Middle Name:*

** Last Name:* Arthur *Suffix:*

** Street 1:* (b) (4)

** City:*

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

*** Signature:** Brian Grzesiuk

***Name:** *Prefix:* ** First Name:* David *Middle Name:*

** Last Name:* Arthur *Suffix:*

Title: Vice President, Federal Affairs **Telephone No.:** [redacted] **Date:** 03/16/2023

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BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Budget Period 1		$	$	$ 10,000,000.00	$ 53,632,193.00	$ 63,632,193.00
2. Budget Period 2				10,000,000.00	58,757,385.00	68,757,385.00
3. Budget Period 3				10,000,000.00	55,942,770.00	65,942,770.00
4. Budget Period 4/5				20,000,000.00	66,715,129.00	86,715,129.00
5. Totals		$	$	$ 50,000,000.00	$ 235,047,477.00	$ 285,047,477.00

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Prescribed by OMB (Circular A -102) Page 1

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) Budget Period 1	(2) Budget Period 2	(3) Budget Period 3	(4) Budget Period 4/5	Total (5)
a. Personnel	$ [redacted]				
b. Fringe Benefits					
c. Travel	0.00	0.00	0.00	0.00	0.00
d. Equipment	18,141,180.00	16,704,330.00	17,933,937.00	23,857,726.00	76,637,173.00
e. Supplies	3,540,712.00	3,500,534.00	3,581,047.00	4,261,165.00	14,883,458.00
f. Contractual	18,407,963.00	14,049,145.00	12,777,278.00	16,973,793.00	62,208,179.00
g. Construction	7,197,035.00	17,948,662.00	16,578,507.00	21,133,307.00	62,857,511.00
h. Other	749,318.00	821,107.00	889,755.00	1,501,942.00	3,962,122.00
i. Total Direct Charges (sum of 6a-6h)	63,632,193.00	68,757,385.00	65,942,770.00	86,715,129.00	$ 285,047,477.00
j. Indirect Charges	0.00	0.00	0.00	0.00	$ 0.00
k. TOTALS (sum of 6i and 6j)	$ 63,632,193.00	$ 68,757,385.00	$ 65,942,770.00	$ 86,715,129.00	$ 285,047,477.00
7. Program Income	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00

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Prescribed by OMB (Circular A -102) Page 1A

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Budget Period 1	$ 53,632,193.00	$ 0.00	$ 0.00	$ 53,632,193.00
9. Budget Period 2	58,757,385.00	0.00	0.00	58,757,385.00
10. Budget Period 3	55,942,770.00	0.00	0.00	55,942,770.00
11. Budget Period 4/5	66,715,129.00	0.00	0.00	66,715,129.00
12. TOTAL (sum of lines 8-11)	$ 235,047,477.00	$ 0.00	$ 0.00	$ 235,047,477.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 10,000,000.00	$ 2,500,000.00	$ 2,500,000.00	$ 2,500,000.00	$ 2,500,000.00
14. Non-Federal	$ 53,632,193.00	13,408,048.00	13,408,048.00	13,408,048.00	13,408,049.00
15. TOTAL (sum of lines 13 and 14)	$ 63,632,193.00	$ 15,908,048.00	$ 15,908,048.00	$ 15,908,048.00	$ 15,908,049.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. DE-FOA-0002740 - Topic Area 2	$ 10,000,000.00	$ 10,000,000.00	$ 10,000,000.00	$ 20,000,000.00
17. N/A	0.00	0.00	0.00	0.00
18. N/A	0.00	0.00	0.00	0.00
19. N/A	0.00	0.00	0.00	0.00
20. TOTAL (sum of lines 16 - 19)	$ 10,000,000.00	$ 10,000,000.00	$ 10,000,000.00	$ 20,000,000.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: 0

22. Indirect Charges: 0

23. Remarks: n/a

PROJECT DESCRIPTION AND ASSURANCES DOCUMENT

Project title: Smart Grid for Smart Decarbonization: Deploying advanced IT/OT to meet nation-leading clean energy mandates

Applicant Name: The Narragansett Electric Company d/b/a Rhode Island Energy

Applicant Address: 280 Melrose Street, Providence, RI, 02907

Names of all team member organizations: PPL Services Corporation

Principal Investigator: Kathy Castro, (b) (6)

Business Point of Contact: Brian Grzesiuk (b) (6)

Notice of Restriction on Disclosure and Use of Data:
Tab a: Personnel, Tab b: Fringe, Tab d: Equipment, and Tab f: Contractual of the Budget Justification Workbook of this document may contain business sensitive, trade secrets, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice].

Federal Share: $50,000,000
Cost Share: $235,047,477
Total Estimated Project Cost: $285,047,477

Item 1: Specify (mark with "X")" the FOA Topic Area and as applicable the Area of Interest (AOI):

_____Topic Area 1: **Grid Resilience Grants** (BIL section 40101(c))

___X___Topic Area 2: **Smart Grid Grants** (BIL section 40107)

_____Topic Area 3: **Grid Innovation Program** (BIL section 40103(b)) – Area of Interest 1 (**Transmission** System Applications)
_____Topic Area 3: **Grid Innovation Program** (BIL section 40103(b)) – Area of Interest 2 (**Distribution** System Applications)
_____Topic Area 3: **Grid Innovation Program** (BIL section 40103(b)) – Area of Interest 3 (**Combination** System Applications)

Item 7:

Authorized Organizational Representative (AOR):

Name: Brian Grzesiuk

Item 8: Signature of Authorized Organizational Representative (AOR)

Brian Grzesiuk

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

OMB Number: 4040-0013
Expiration Date: 02/28/2025

1. * Type of Federal Action:
- ☐ a. contract
- ☒ b. grant
- ☐ c. cooperative agreement
- ☐ d. loan
- ☐ e. loan guarantee
- ☐ f. loan insurance

2. * Status of Federal Action:
- ☒ a. bid/offer/application
- ☐ b. initial award
- ☐ c. post-award

3. * Report Type:
- ☒ a. initial filing
- ☐ b. material change

4. Name and Address of Reporting Entity:

☒ Prime ☐ SubAwardee

* Name: The Narragansett Electric Company d/b/a Rhode Island Energy

* Street 1: 280 Melrose Street Street 2:

* City: Providence State: RI: Rhode Island Zip: 02907

Congressional District, if known:

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency:

Department of Energy

7. * Federal Program Name/Description:

Bipartisan Infrastructure Law Grid Resilience and Innovation Partnerships (GRIP)

CFDA Number, *if applicable:*

8. Federal Action Number, *if known:*

DE-FOA-0002740

9. Award Amount, *if known:*

$

10. a. Name and Address of Lobbying Registrant:

Prefix: * First Name: David Middle Name:

* Last Name: Arthur Suffix:

* Street 1: (b) (4)

* City:

b. Individual Performing Services (including address if different from No. 10a)

Prefix: * First Name: David Middle Name:

* Last Name: Arthur Suffix:

* Street 1: Street 2:

* City: State: Zip:

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

* Signature:

*Name: Prefix: * First Name: David Middle Name:

* Last Name: Arthur Suffix:

Title: Vice President, Federal Affairs Telephone No.: (b) (4) Date: 03/10/2023

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OMB Number: 4040-0004
Expiration Date: 11/30/2025

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/16/2023

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: The Narragansett Electric Company

* b. Employer/Taxpayer Identification Number (EIN/TIN): 05-0187805

* c. UEI: SGGXNGJ613C3

d. Address:

* Street1: 280 Melrose Street
Street2:
* City: Providence
County/Parish:
* State: RI: Rhode Island
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 029072157

e. Organizational Unit:

Department Name: Asset Management and Planning

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Brian
Middle Name:
* Last Name: Grzesiuk
Suffix:

Title: Senior Finance Manager

Organizational Affiliation:

* Telephone Number: (b) (6)
Fax Number:

* Email: (b) (6)

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

Q: For-Profit Organization (Other than Small Business)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

National Energy Technology Laboratory

11. Catalog of Federal Domestic Assistance Number:

81.254

CFDA Title:

Grid Infrastructure Deployment and Resilience

*** 12. Funding Opportunity Number:**

DE-FOA-0002740

* Title:

BIL Grid Resilience and Innovation Partnerships (GRIP)

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Smart Grid for Smart Decarbonization. Deploying advanced IT/OT to meet nation-leading clean energy mandates.

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: RI-001 * b. Program/Project: RI-All

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 01/01/2024 * b. End Date: 12/31/2028

18. Estimated Funding ($):

* a. Federal	50,000,000.00
* b. Applicant	235,047,477.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	285,047,477.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name: Brian

Middle Name:

* Last Name: Grzesiuk

Suffix:

* Title: Senior Finance Manager

* Telephone Number: (b) (6) Fax Number:

* Email: (b) (6)

* Signature of Authorized Representative: Brian Grzesiuk * Date Signed: 03/16/2023

Notice of Restriction on Disclosure and Use of Data:

Tab a: Personnel, Tab b: Fringe, Tab d: Equipment, and Tab f: Contractual of the Budget Justification Workbook of this document may contain business sensitive, trade secrets, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice].

Smart Grid for Smart Decarbonization:
Deploying advanced IT/OT to meet nation-leading clean energy mandates

FOA Number: DE-FOA-0002740
BIL – Grid Resilience and Innovation Partnerships (GRIP)
Topic Area 2: Smart Grid Grants (BIL section 40107)

Team Member Organizations
The Narragansett Electric Company d/b/a Rhode Island Energy, Prime Applicant
PPL Services Corporation, Team Member

Technical Point of Contact
Kathy Castro
Director of Asset Management and Planning
Rhode Island Energy
(b) (4), (b) (6)

Business Point of Contact
Brian Grzesiuk
Senior Finance Manager
Rhode Island Energy
(b) (4), (b) (6)

Project Location
State of Rhode Island

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Rhode Island Energy™
a PPL company

Instructions and Summary

Award Number: _____ **Date of Submission:** 3/16/2023

Award Recipient: _____ **Form submitted by:** The Narragansett Electric Co d/b/a Rhode Island Energy

(May be award recipient or sub-recipient)

Notice of Restriction on Disclosure and Use of Data: Tab a: Personnel, Tab b: Fringe, Tab d: Equipment, and Tab f: Contractual of the Budget Justification Workbook of this document may contain business sensitive, trade secrets, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice].

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your DOE contact!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. with total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item within each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab.
8. ALL budget period cost categories are rounded to the nearest dollar.

BURDEN DISCLOSURE STATEMENT

Public reporting burden for this collection of information is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary

	Federal	Cost Share			Total Costs	Cost Share %	Proposed Budget Period Dates
Budget Period 1	$10,000,000	$53,632,193			$63,632,193	84.28%	01/01/2024 - 12/31/2024
Budget Period 2	$10,000,000	$58,757,385			$68,757,385	85.46%	01/01/2025 - 12/31/2025
Budget Period 3	$10,000,000	$55,942,770			$65,942,770	84.84%	01/01/2026 - 12/31/2026
Budget Period 4	$10,000,000	$50,689,910			$60,689,910	83.52%	01/01/2027 - 12/31/2027
Budget Period 5	$10,000,000	$16,025,219			$26,025,219	61.58%	01/01/2028 - 12/31/2028
Total	$50,000,000	$235,047,477			$285,047,477	82.46%	

Section B - Budget Categories

CATEGORY								**Comments** (as needed)
a. Personnel	(b) (4)							
b. Fringe Benefits								
c. Travel								
d. Equipment	$18,141,180	$16,704,330	$17,933,937	$18,309,294	$5,548,432	$76,637,173	26.89%	
e. Supplies	$3,540,712	$3,500,534	$3,581,047	$3,645,117	$616,048	$14,883,458	5.22%	
f. Contractual								
Sub-recipient	$0	$0	$0	$0	$0	$0	0.00%	
Vendor	$18,407,963	$14,049,145	$12,777,278	$13,014,942	$3,958,851	$62,208,179	21.82%	
FFRDC	$0	$0	$0	$0	$0	$0	0.00%	
Total Contractual	$18,407,963	$14,049,145	$12,777,278	$13,014,942	$3,958,851	$62,208,179	21.82%	
g. Construction	$7,197,035	$17,948,662	$16,578,507	$12,192,647	$8,940,660	$62,857,511	22.05%	
h. Other Direct Costs	$749,318	$821,108	$889,755	$946,394	$555,548	$3,962,123	1.39%	
Total Direct Costs	**$63,632,193**	**$68,757,385**	**$65,942,770**	**$60,689,910**	**$26,025,219**	**$285,047,477**	**100.00%**	
i. Indirect Charges	$0	$0	$0	$0	$0	$0	0.00%	
Total Costs	**$63,632,193**	**$68,757,385**	**$65,942,770**	**$60,689,910**	**$26,025,219**	**$285,047,477**	**100.00%**	

Additional Explanation (as needed):

a. Personnel

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

INSTRUCTIONS - PLEASE READ!!!

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and vendors must be included under f. Contractual.
2. All personnel should be identified by position title and not employee name. Enter the amount of time (e.g., hours or % of time) and the base pay rate and the total direct personnel compensation will automatically calculate. Rate basis (e.g., actual salary, labor distribution report, state civil service rates, etc.) must also be identified.
3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e.g. fee or profit).
4. If a position and hours are attributed to multiple employees (e.g. Technician working 4000 hours) the number of employees for that position title must be identified.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 3	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 4	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 5			
1	Sr. Engineer **(EXAMPLE!!!)**	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	200	$50.00	$10,000	200	$50.00	$10,000	2400	$190,000	Actual Salary

(b) (4)

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Pay Rate	Total Budget	Time (Hrs)	Pay Rate	Total Budget	Time (Hrs)	Pay Rate	Total Budget	Time (Hrs)	Pay Rate	Total Budget	Time (Hrs)	Pay Rate	Total Budget			
(b) (4)																			

Additional Explanation (as needed):

a. Personnel-Confidential

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

b. Fringe Benefits

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

INSTRUCTIONS - PLEASE READ!!!
1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
EXAMPLE!!! Sr. Engineer	$170,000	20%	$34,000	$10,000	20%	$2,000	$10,000	20%	$2,000	$10,000	20%	$2,000	$10,000	20%	$2,000	$38,000
Total Personnel																
Total:																

(b) (4)

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

_____ A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.*

_X____ There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification (Form EERE 335.1).

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at http://www1.eere.energy.gov/financing/resources.html, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate.

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

c. Travel

INSTRUCTIONS - PLEASE READ!!!

1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.

2. All listed travel must be necessary for performance of the Statement of Project Objectives.

3. Federal travel regulations are contained within the applicable cost principles for all entity types. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.

4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
	Domestic Travel	**Budget Period 1**									
1	**EXAMPLE!!!** Visit to PV manufacturer			2	2	$250	$500	$100	$160	$2,020	Current GSA rates
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 1 Total									**$0**	
	Domestic Travel	**Budget Period 2**									
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 2 Total									**$0**	
	Domestic Travel	**Budget Period 3**									
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 3 Total									**$0**	
	Domestic Travel	**Budget Period 4**									
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 4 Total									**$0**	
	Domestic Travel	**Budget Period 5**									
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 5 Total									**$0**	
	PROJECT TOTAL									**$0**	

Additional Explanation (as needed):

d. Equipment

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

INSTRUCTIONS - PLEASE READ!!!

1. Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.

2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.

3. During award negotiations, provide a vendor quote for all equipment items over $50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.

4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1						
3,4,5	**EXAMPLE!!!** Thermal shock chamber	2	$70,000	$140,000	Vendor Quote - Attached	Reliability testing of PV modules- Task 4.3
[redacted]				$343,750		
				$30,000		
				$343,750		
				$30,000		
				$13,635,186		
				$2,460,945		
				$680,959		
				$616,590		
				$0		
	Budget Period 1 Total			$18,141,180		
Budget Period 2						
[redacted]				$13,948,795		
				$917,434		
				$746,380		
				$1,091,720		
				$0		
	Budget Period 2 Total			$16,704,330		
Budget Period 3						
[redacted]				$14,269,617		
				$938,535		
				$763,547		
				$719,735		
				$631,688		
				$610,814		
				$0		
	Budget Period 3 Total			$17,933,937		
Budget Period 4						
[redacted]				$14,597,819		
				$948,484		
				$781,108		
				$0		
				$760,255		
				$1,221,628		
				$0		
	Budget Period 4 Total			$18,309,294		
Budget Period 5						
[redacted]				$3,745,244		
				$0		
				$532,716		
				$0		
				$583,306		
				$687,166		
				$0		
	Budget Period 5 Total			$5,548,432		
	PROJECT TOTAL			**$76,637,173**		

Additional Explanation (as needed):

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

e. Supplies

INSTRUCTIONS - PLEASE READ!!!

1. Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Please refer to the applicable Federal regulations in 2 CFR 200 for specific supplies definitions and treatment.

2. List all proposed supplies below, providing a basis of costs (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

3. Multiple supply items valued at $5,000 or less used to assemble an equipment item with a value greater than $5,000 with a useful life of more than one year should be included on the equipment tab. If supply items and costs are ambiguous in nature, contact your DOE representative for proper categorization.

4. Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1						
4,6	**EXAMPLE!!!** Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
5	Supplies - Smart Field Devices	48,704	$72.70	$3,540,712	Cost Estimate	Supplies for Smart Devices (Reclosers, Cap Banks, Regulators, Other)
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 1 Total			**$3,540,712**		
Budget Period 2						
5	Supplies - Smart Field Devices	10,740	$326	$3,500,534	Cost Estimate	Supplies for Smart Devices (Reclosers, Cap Banks, Regulators, Other)
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 2 Total			$3,500,534		
Budget Period 3						
5	Supplies - Smart Field Devices	10,740	$333	$3,581,047	Cost Estimate	Supplies for Smart Devices (Reclosers, Cap Banks, Regulators, Other)
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 3 Total			$3,581,047		
Budget Period 4						
5	Supplies - Smart Field Devices	10,610	$344	$3,645,117	Cost Estimate	Supplies for Smart Devices (Reclosers, Cap Banks, Regulators, Other)
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 4 Total			$3,645,117		
Budget Period 5						
5	Supplies - Smart Field Devices	8,779	$70	$616,048	Cost Estimate	Supplies for Smart Devices (Reclosers, Cap Banks, Regulators, Other)
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 5 Total			$616,048		
	PROJECT TOTAL			**$14,883,458**		

Additional Explanation (as needed):

f. Contractual

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

INSTRUCTIONS - PLEASE READ!!!

1. The entity completing this form must provide all costs related to sub-recipients, vendors, and FFRDC partners in the applicable boxes below.

2. Sub-recipients (partners, sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) $100,000 or (2) 25% of total award costs. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whether the objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

3. Vendors (including contractors): List all vendors and contractors supplying commercial supplies or services used to support the project. For each Vendor cost with total project costs of $100,000 or more, a Vendor quote must be provided. A vendor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competitive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this information directly to DOE, however project costs must also be provided below.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Sub-Recipient Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
2,4	**EXAMPLE!!!** XYZ Corp.	Partner to develop optimal lens for Gen 2 product. Cost estimate based on personnel hours.	$48,000	$32,000	$16,000			**$96,000**
								$0
								$0
								$0
								$0
								$0
								$0
		Sub-total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

SOPO Task #	Vendor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
6	**EXAMPLE!!!** ABC Corp.	Vendor for developing robotics to perform lens inspection. Estimate provided by vendor.	$32,900	$86,500				**$119,400**
		(b) (4)						$1,692,938
								$1,971,476
								$8,531,143
								$22,198,408
								$711,987
								$13,472,995
								$283,415
								$13,345,817
								$0
								$0
								$0
		Sub-total	**$18,407,963**	**$14,049,145**	**$12,777,278**	**$13,014,942**	**$3,958,851**	**$62,208,179**

SOPO Task #	FFRDC Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
								$0
								$0
		Sub-total	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

	Total Contractual		**$18,407,963**	**$14,049,145**	**$12,777,278**	**$13,014,942**	**$3,958,851**	**$62,208,179**

Additional Explanation (as needed):

Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure

g. Construction

PLEASE READ!!!

1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient should be entered under f. Contractual.

2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities: Example Only!!! - Build wind turbine platform

SOPO Task #	General Description	Cost	Basis of Cost	Justification of need
Budget Period 1				
3	EXAMPLE ONLY!!! Three days of excavation for platform site	$28,000	Engineering estimate	Site must be prepared for construction of platform.
5	Construction - Smart Field Devices	$7,197,035	Estimate	Construction of Smart Field Devices
	Budget Period 1 Total	$7,197,035		
Budget Period 2				
5	Construction - Smart Field Devices	$17,948,662	Estimate	Construction of Smart Field Devices
	Budget Period 2 Total	$17,948,662		
Budget Period 3				
5	Construction - Smart Field Devices	$16,578,507	Estimate	Construction of Smart Field Devices
	Budget Period 3 Total	$16,578,507		
Budget Period 4				
5	Construction - Smart Field Devices	$12,192,647	Estimate	Construction of Smart Field Devices
	Budget Period 4 Total	$12,192,647		
Budget Period 5				
5	Construction - Smart Field Devices	$8,940,660	Estimate	Construction of Smart Field Devices
	Budget Period 5 Total	$8,940,660		
	PROJECT TOTAL	**$62,857,511**		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ!!!

1. Other direct costs are direct cost items required for the project which do not fit clearly into other categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).

2. Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

3. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
	Budget Period 1			
5	**EXAMPLE!!!** Grad student tuition - tasks 1-3	$16,000	Established UCD costs	Support of graduate students working on project
4	Other - Asset Hub	$275,000	Estimates	Other costs
5	Other - Smart Field Devices	$474,318	Estimates	Other costs
	Budget Period 1 Total	$749,318		
	Budget Period 2			
4	Other - Asset Hub	$325,000	Estimates	Other costs
5	Other - Smart Field Devices	$496,108	Estimates	Other costs
	Budget Period 2 Total	$821,108		
	Budget Period 3			
4	Other - Asset Hub	$350,000	Estimates	Other costs
5	Other - Smart Field Devices	$539,755	Estimates	Other costs
	Budget Period 3 Total	$889,755		
	Budget Period 4			
4	Other - Asset Hub	$388,000	Estimates	Other costs
5	Other - Smart Field Devices	$558,394	Estimates	Other costs
	Budget Period 4 Total	$946,394		
	Budget Period 5			
4	Other - Asset Hub	$413,000	Estimates	Other costs
5	Other - Smart Field Devices	$142,548	Estimates	Other costs
	Budget Period 5 Total	$555,548		
	PROJECT TOTAL	**$3,962,123**		

Additional Explanation (as needed):

Confidential

i. Indirect Costs

INSTRUCTIONS - PLEASE READ!!!
1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.
2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.
3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total	Explanation of BASE
Provide ONLY Applicable Rates:							
Overhead Rate	0.00%	0.00%	0.00%	0.00%	0.00%		
General & Administrative (G&A)	0.00%	0.00%	0.00%	0.00%	0.00%		
FCCM Rate, if applicable	0.00%	0.00%	0.00%	0.00%	0.00%		
OTHER Indirect Rate	0.00%	0.00%	0.00%	0.00%	0.00%		
Indirect Costs (As Applicable):							
Overhead Costs						**$0**	
G&A Costs						**$0**	
FCCM Costs, if applicable						**$0**	
OTHER Indirect Costs						**$0**	
Total indirect costs requested:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

_____ An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.

_____ There is not a current, federally approved rate agreement negotiated and available*.

***When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided by your DOE contact, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Additionally, any non-Federal entity that has never received a negotiated indirect cost rate, except for those non-Federal entities described in Appendix VII to Part 200—States and Local Government and Indian Tribe Indirect Cost Proposals, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely.As described in §200.403 Factors affecting allowability of costs, costs must be consistently charged as either indirect or direct costs, but may not be double charged or inconsistently charged as both. If chosen, this methodology once elected must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which the non-Federal entity may apply to do at any time.**

You must provide an explanation (below or in a separate attachment) and show how your indirect cost rate was applied to this budget in order to come up with the indirect costs shown.

Additional Explanation (as needed): *IMPORTANT: Please use this box (or an attachment) to further explain how your total indirect costs were calculated. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total).

Cost Share

PLEASE READ!!!

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.

2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.

3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share Item section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. **Vendors may not provide cost share**. Any partial donation of goods or services is considered a discount and is not allowable.

4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.

5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

6. NOTE: A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**

7. NOTE: A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**

8. Each budget period is rounded to the nearest dollar.

Organization/Source	Type (Cash or In Kind)	Cost Share Item	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Project Cost Share
ABC Company **EXAMPLE!!!**	Cash	Project partner ABC Company will provide 20 PV modules for product development at the price of $680 per module	$13,600					**$13,600**
The Narragansett Electric Co d/b/a Rhode Island Energy	Cash	Smart Grid Investment	$53,632,193	$58,757,385	$55,942,770	$50,689,910	$16,025,219	**$235,047,477**
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		Totals	**$53,632,193**	**$58,757,385**	**$55,942,770**	**$50,689,910**	**$16,025,219**	**$235,047,477**

Total Project Cost: $285,047,477 **Cost Share Percent of Award: 82.5%**

Additional Explanation (as needed):

Applicant Name: 0 Award Number: 0

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. Budget Period 1				$10,000,000	$53,632,193		$63,632,193
2. Budget Period 2				$10,000,000	$58,757,385		$68,757,385
3. Budget Period 3				$10,000,000	$55,942,770		$65,942,770
4. Budget Period 4				$10,000,000	$50,689,910		$60,689,910
5. Budget Period 5				$10,000,000	$16,025,219		$26,025,219
6. Totals				$50,000,000	$235,047,477		$285,047,477

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a. Personnel	(b) (4)					
b. Fringe Benefits						
c. Travel	$0	$0	$0	$0	$0	$0
d. Equipment	$18,141,180	$16,704,330	$17,933,937	$18,309,294	$5,548,432	$76,637,173
e. Supplies	$3,540,712	$3,500,534	$3,581,047	$3,645,117	$616,048	$14,883,458
f. Contractual	$18,407,963	$14,049,145	$12,777,278	$13,014,942	$3,958,851	$62,208,179
g. Construction	$7,197,035	$17,948,662	$16,578,507	$12,192,647	$8,940,660	$62,857,511
h. Other	$749,318	$821,108	$889,755	$946,394	$555,548	$3,962,123
i. Total Direct Charges (sum of 6a-6h)	$63,632,193	$68,757,385	$65,942,770	$60,689,910	$26,025,219	$285,047,477
j. Indirect Charges	$0	$0	$0	$0	$0	$0
k. **Totals** (sum of 6i-6j)	$63,632,193	$68,757,385	$65,942,770	$60,689,910	$26,025,219	$285,047,477
7. Program Income						$0

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