



Four to six feet long invasive species iguanas have caused more than fifteen large scale electric outages in Lake Worth Beach during 2022.¹

Technical Volume

Funding Opportunity Announcement (FOA) Number: DE-FOA-0002740 – Topic Area 2
FOA Topic Section 40101(c): Grid Resilience Grants

System Hardening & Reliability Improvement Program (SHRIP) Topic Area 2

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Project Location

City of Lake Worth Beach Electric Utility; 1900 2nd Avenue North, Lake Worth Beach, FL 33461

This application does not contain any confidential information.

¹ [Iguanas are causing power outages in Florida: NPR](#)

PROJECT OVERVIEW

BACKGROUND

The City of Lake Worth Beach (the City) currently ranks as one of the least reliable electric utilities in the State of Florida. Its **baseline electrical infrastructure** is aged beyond end of its useful life and is experiencing frequent failures. Due to its location as a coastal city, the severity and intensity of tropical storms and hurricanes pose a serious danger to the grid and outages are extended and frequent. Because of malfunctioning metering equipment, faults are time-consuming to identify and repair. The system does not have the technology that can provide real time information to grid operators, rebalance the system, or redirect load, causing pole fires due to current overload. These problems are exacerbated by recent population growth that has placed additional energy burdens on the conductors. Furthermore, the grid is ill-prepared for the challenges of the twenty-first century. It relies on outdated communication systems, including handheld radios, which makes data and information highly vulnerable to hackers, and although the City has created a solar-generating project and installed EV charging stations, distributed resources have not yet been fully integrated into the grid, limiting the effect of its green initiatives and preventing it from reaching its goal of carbon neutrality by 2045. The infrastructure is thus badly in need of repair as well as technological upgrades.

While the City has **successfully** dedicated millions of dollars in bond funding to implementing technology solutions that increase the flexibility, efficiency, **reliability and resilience** of the electric power system, it will require significant additional funds to complete the project. The City lacks the resources to fully address these challenges, in part because it has a large low-income population, with an estimated disadvantaged community population percentage exceeding 80%. Furthermore, the responsibility for implementing power upgrades currently rests entirely on the City; unlike most cities in surrounding areas, the City owns and operates its own small² electric utility company, the City of Lake Worth Beach Utility (CLWBU). Together with ownership interests in larger power plants statewide, CLWBU makes up approximately 50% of its energy needs, with the balance met by a contract with Orlando Utilities Commission. The City is thus responsible for funding utility improvements internally, but the burden of needed repairs exceeds its abilities.

Consequently, the City is applying to BIL-Grid Resilience Topic Area 2 Smart Grid opportunity to modernize its system capabilities. With the help of DOE funding, the City will purchase and deploy smart grid technology to increase electricity delivery reliability, integrate existing grid-edge renewable energy, improve system monitoring and control for system operators and customer communication during outages, and anticipate and mitigate the effects of severe-weather events. The **history** of the City's efforts includes leveraging private sector and non-federal public capital as part of the SHRIP (System Hardening and Reliability Improvement Program) initiative launched by Lake Worth Beach in 2019, which includes **successful** passage of a bond measure that will allow the City to fully fund its 50% cost share. SHRIP serves as a **project development** framework to bring advanced technology to the City's grid that will equip the

² Small utility is defined as an entity that sells no more than 4,000,000 MWh of electricity per year.

system operators to manage for flexibility, efficiency, reliability and resilience. These long-range multi-year capital improvement plans focus on addressing the most consequential system needs, as well as creating meaningful and robust engineering and technology opportunities. However, because the changes are extensive and system-wide, DOE support is necessary to fully fund the proposal. Without DOE GRIP support, these planned upgrades are projected to take 10-20 years to fully complete. With GRIP support, we anticipate reducing the time to completion of the entire SHRIP to 5 years, with many initiatives completed in 3 years. The result will be a highly adept system that will employ greater reliability, improve equity, and incorporate a renewable energy system that will advance the City on the path to carbon neutrality.

PROJECT GOAL. A Smart Grid grant (BIL section 40107) would support a series of five (5) **targeted improvements to the baseline infrastructure** that will transform the community's electrical grid and reduce its vulnerability to climate change:

- **Sectionalizing devices:** Improve operator monitoring and control of the electrical system to allow power restoration within minutes or seconds of outages by adding reclosers and other sectionalizing devices.
- **Fiber Optics:** Enhance secure communication and data flow between electric distribution components with fiber and remote sensing devices.
- **Interconnection and Battery Storage for Community Solar:** Enhance electric distribution system configuration and operability to integrate a battery energy storage system with the City's existing solar installation and allow for further expansion of the project site to accommodate an estimated additional 7 MW AC of solar capacity.
- **Advanced Metering Infrastructure (AMI) System:** Installation of an AMI system with bidirectional communications to improve grid visibility by system operators to facilitate more efficient and accurate system-related decisions using technology.
- **Meter Data Management (MDM) System:** Install an MDM system that receives, stores and usefully displays incoming AMI data for grid operators to manage demand load.

Each of the initiatives above, including specific steps towards implementation, is described further in the section on Technical Description, Innovation, and Impact. These projects will yield significant benefits to Justice40 communities, including energy stability and pathways to good quality jobs. The **success of the overall project** will be supported by the robust effort of the Community Benefits Plan in leveraging partners to identify, recruit and train new City and contractor staff from local pools.

DOE IMPACT. While the City plans to address the most critical vulnerabilities with its existing funds, federal funding is necessary to achieve a Smart Grid. Receiving DOE support would substantially catalyze non-federal public funding for long-term job creation and community development, transforming the project from partially repairing a failing system to **investing in power system infrastructure that addresses critical needs**, responds to climate challenges, and allows for future growth. The **SHRIP** Initiatives started by the City are currently funded by the City's Utilities Series 2020 and 2022 revenue bond funds. All capital projects have individual project schedules and spending tracking which would be substantially shortened by DOE funds, with the **additive benefit from the federal funding** illustrated by the table below:

Expected Time Frame to Completion of Initiatives (years) without and with GRIP funding			
SHRIP Initiative		Without	With
1	Sectionalizing Devices: Addition of reclosers and switches as circuit sectionalizing devices to isolate faults and quickly restore service during outages using alternate paths around faulted areas.	20+	3
2	Fiber Optics: Add fiber to/from each of our substations and to the most mission critical remote line devices.	-	3
3	Interconnection and Battery Storage for Community Solar: Add enhanced electric distribution system configuration to our existing 1.7 MW local solar capacity and create a battery storage facility while also providing improved interconnection capability for approximately 7 MW of new solar capacity in the future.	-	5
4	Advanced Metering Installation: Install an Advanced Metering Infrastructure (AMI) System with bidirectional communication.	20+	3
5	Data Management and Control: Install a Meter Data Management and Control System to interface with AMI and support Energy Conservation and Demand Response.	20+	3

Table 1: How GRIP funding will impact SHRIP timelines

Many of these projects cannot be fully built or deployed without GRIP funding. The major barrier to accomplishing the goals set out in this proposal is funding limitation. The City has raised matching funds using two rounds of Utility Revenue Bonds. Of the first bond, (secured in 2020), most projects are already in motion and either in construction or design phases. Of the second bond (secured in 2022), the projects are just starting in the design phase with construction expected to start by late 2023 with depletion of most of the funds expected by early 2026. To continue the projects, the City will need to issue revenue bonds again in 2024 or 2025, which will be challenging and perhaps not feasible for its low-income community to support. But even with a third round of funding, the work would remain incomplete; a fourth bond sale would likely be needed sometime around 2026/2028. However, these amounts would be far from enough to modernize the grid; further work would need to continue for up to another decade and be contingent on additional funding. With GRIP funding, the project becomes **economically viable** and we would be able to execute on multiple projects at the same time.

COMMUNITY BENEFITS PLAN: JOB QUALITY AND EQUITY. The City's electric utility serves one of the most ethnically and racially diverse municipalities in Palm Beach County, Florida. As discussed below, our community will **receive the overall anticipated benefits**. The EJI (EPA Environmental Justice Index) demonstrates that **People of Color** represent 69% of the community, a demographic index of ~90% of residents with **Less Than High School Education** and **Limited English Speaking** at nearly 90%. It also has a high proportion of disadvantaged communities. In 2019, 27.4% of residents were considered impoverished, which is more than twice the countywide average of 12.0% and the Florida average of 12.4%.

Access to reliable power is a benefit to all communities, but outages and power quality issues disproportionately impact disadvantaged communities (DACs) in the service area outlined in Figure 1, which are less likely to have modern infrastructure, renewable energy systems, and backup power systems in place. Using Climate and Economic Justice Screening Tool, twelve DAC census tracts with 42,990 residents were located in the service area, with approximately 88% of the residents living in census tracts that are designated DAC.

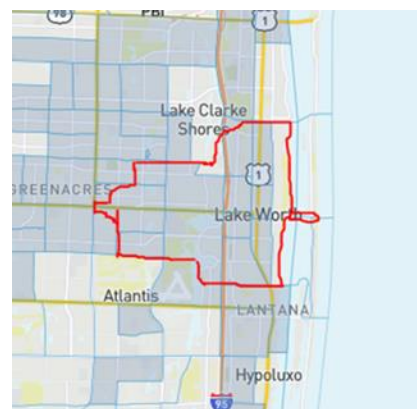


Figure 1 - Disadvantaged Community Census Tracts in Service Territory

The Community Benefits Plan (CBP) identifies the **overall anticipated** benefits that will accrue to the local community and DACs. Because the proposed project will encompass the entire electric utility service area and because that service area is comprised of more than 80% DACs, benefits to Justice40 communities will greatly exceed the federal target of 40%. The project will **maximize the project's benefits across DACs** in the following ways: reduced outages; reduced environmental exposure from retirement of a fossil fuel plant; access to low cost capital from a DAC solar loan fund; clean energy jobs and training from apprentice programs and community partner contributions; clean energy enterprise creation by enabling solar throughout the community and providing business support to local, DAC enterprises; **energy democracy** by enhancing a citizen-owned municipal energy infrastructure that serves more than 80% DACs; increased parity from grid improvements enabling solar/EV and from the loan funds; and minority and disadvantaged business contracting opportunities from developing small bid opportunities and business support. The **enhanced system value** would accrue to DAC residents through reliability and reduced maintenance costs, and the City's multilingual community engagement staff will focus on reaching historically underserved populations "where they are" about how to best take advantage of the benefits of the project, including opportunities for jobs and workforce training.

The City has worked with community partners on a **plan to attract, train and retain a skilled workforce** and is committed to investing in America's workforce in a meaningful way, especially through local ties. 97% of the City employees are union eligible, and the City has Collective Bargaining Agreements (CBAs) with the labor unions listed below as well as its contractors. These CBAs will serve as the enforceable workforce agreements for this project.

- International Brotherhood of Electrical Workers (IBEW) has 83% minority membership;
- Public Employees Union (PEU) has 68% minority membership; and
- Professional Managers and Supervisors Association (PMSA) has 51% minority membership.

The proposed project builds on these existing relationships between labor unions and the City, provides skill upgrades for local workers, and offers new possibilities for good quality jobs. The City will create ten new full-time positions to implement this project, with wages exceeding prevailing wage, the option to join a union and with training to advance on a career path (a "quality job"). The project also includes four apprentice positions that will transition into full

time, permanent union-eligible positions at the conclusion of the project. The CBP identifies a strong set of partners to build a skilled labor force. These partners can support DAC community members from the baseline of job readiness (Career Source) to scholarship programs (DeVry) to dedicated advising and job fairs (Palm Beach State College).

LONG-TERM CONSTRAINTS ON NATURAL RESOURCES. No long-term constraints on the community's access to natural resources are anticipated as a result of this project. Short-term effects of the project may include moderate exposure to noise or dust during the construction or installation phases. A comprehensive clean-up strategy is factored into each initiative in the project, and personnel and funds will be available for thorough end-stage site maintenance.

CLIMATE RESILIENCE STRATEGY. Due to its location in a high-risk hurricane zone, the City has regularly been impacted by hurricanes and other weather events that are exacerbated and made even more frequent because of climate change. The City's proposed upgrades are designed to be resilient to flooding, high winds and summer heat, climate impacts that are likely to increase. As a coastal community already experiencing the effects of climate change including sea level rise and violent hurricane events, the City has completed its 2022 and beyond Integrated Resource Plan (IRP) that specifies the energy supply resources that will be needed to reach its stated goal of zero carbon energy by 2045 and the SHRIP program to identify and implement infrastructure upgrades to address climate change impacts. As the local tropical-like climate is especially prone to power outages, the City's smart grid installations will mitigate damage and outage durations.


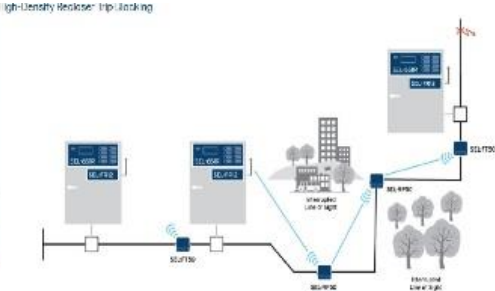


TECHNICAL DESCRIPTION, INNOVATION, AND IMPACT: RELEVANCE AND OUTCOMES

RELEVANCE AND OUTCOMES. Incorporating smart grid upgrades into Lake Worth Beach's infrastructure will provide a host of long-term benefits. The five subprojects, described below, provide new methods and technical approaches to prevent faults, improve security, integrate the renewable energy infrastructure, and create overall visibility improvements to the operators and autonomous control success. The end result will be a modern, future-facing electrical system that will prepare Lake Worth Beach to accommodate change for decades to come.

#	Subproject Name	Function
1	Sectionalizing Devices	Use of sectionalizing devices to isolate faults and quickly restore service using alternate paths around fault areas, increasing grid reliability and ability to utilize DERs during outages.
2	Fiber Optic Connections	Install new fiberoptic lines to protect high-speed information flow
3	Interconnection and Battery Storage for Community Solar	Fully integrate Lake Worth Beach's existing renewable energy infrastructure to accommodate battery energy storage and prepare for expansion of solar energy project.
4	Advanced Metering Infrastructure	Enable customers to measure their power usage and provides bidirectional communication with DERs.

#	Subproject Name	Function
5	Meter Data Management System	Improve grid visibility to operators to better control power flow and enables energy conservation and optimization of DERs and VERs.

The following tables provide detailed description of the subprojects, including grid outcomes, the technology used, and other principles and objectives that will be pursued during the project.

Subproject 1: Sectionalizing Devices	
Background / Reason	Reclosers, sectionalizing devices, sensors and enhanced communications will prevent interruptions and allow power to be quickly restored in case of an outage. The City has over 36 electric power feeders serving our community, but many of these feeders lack digital technology needed to rapidly and reliably execute on operator or system generated commands. Adding smart grid devices would not only provide us system status data at various locations but also provide automated sectionalizing around problem areas furthering rapid restoration. The data will enable live condition monitoring in our 24-hour systems operations center's System Control and Data Acquisition (SCADA) System, allowing for a more customer-centered response using either manual remote control or total automation to isolate the faults and restore power promptly.
Description of Tasks	<ul style="list-style-type: none"> • Installation of reclosers. • Installation of sectionalizing devices. • Installation of sensors. • Installation of communications upgrades. <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>
Grid Outcomes	<p>Increase flexibility, efficiency, reliability and resilience</p> <p>These projects will lead to fewer outages, more rapid restoration, decreased use of fossil fuels, proactive live engagement to detect potential issues by our system operators, and improved grid planning for future needs utilizing analysis tools related to climate change and system load. The expected outcomes from recloser implementation will include a reduction in System</p>

Subproject 1: Sectionalizing Devices	
	Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI), indexes used nationwide in the electric utility industry to measure system performance. In addition to active outage response, we will be able improve the results of interconnection studies and community requests that potentially affect the grid, such as connecting customer-owned renewable generation systems such as rooftop solar systems, vehicle to grid devices and battery energy storage systems. The data points will provide time-synchronized data that would assist in proactive planning around system limitations and lead to enhancements related to community needs, climate change, and evolving green energy options.
Subproject 2: Fiber Optic Connections	
Background / Reason	Upgrading from the current and more vulnerable radio communications to fiber optic data communications is under way to increase system security and shorten response times. Some fiber optic runs have already been installed, but 8 substations currently lack funding.
Description of Tasks	<ul style="list-style-type: none"> • Install new fiber optic lines to / from 8 substations • Incorporate cybersecurity measures.
Grid Outcomes	<p>Enhance secure communication.</p> <p>This initiative will provide multiple high-speed backhaul points to our substations and give our remote radio locations a closer backhaul location, as well as high-speed protection improvements. Cybersecurity enhancements inherent in fiber optic communications will enhance grid integrity and reduce vulnerability to cyberattacks.</p>
Subproject 3: Interconnection and Battery Storage for Community Solar	
Background / Reason	This project will enhance the distribution system's ability to absorb higher quantities of solar energy while also serving a nearby public school and community center. The City has already made strides towards its goal of becoming carbon-neutral by 2045 by building a 1.7 MW solar field atop a closed city-owned landfill. The solar power site rests on an old landfill that was repurposed for green energy and has additional room for expansion. This project would more fully tie this site into the infrastructure and provide battery storage to distribute energy resources across the grid.
Description of Tasks	<ul style="list-style-type: none"> • Install energy storage for the community. • Integrate existing solar energy into the grid.
Grid Outcomes	<p>Interconnect new clean energy to enhance generation mix diversity</p> <p>New connections would connect the solar project to the school and community center while also allowing the development of solar power to replace some of the fossil-fuel generation that Lake Worth Beach currently uses. Battery storage would extend the usefulness of the solar plant for nighttime use.</p>
Subproject 4: Advanced Metering Infrastructure (AMI)	
Background / Reason	At present, technicians cannot always determine which customers have electricity, leading to long wait times until repairs can be isolated and effected. New metering infrastructure will identify faults and integrate data consumption details into multiple City systems. DOE funds will be used to acquire a system featuring strong, bidirectional, and secure data communication systems that can receive high temporal resolution (e.g., 15 min) data from end-users and DERs, as well as send high resolution control data to the same. Additionally, the system will be chosen to fully meet the most recent DOE cybersecurity requirements and recommendations.
Description of Tasks	Installation of Advanced Metering Infrastructure (AMI) with the above capabilities.
Grid Outcomes	<p>Improve visibility.</p> <p>Will improve grid visibility and condition to facilitate more efficient and accurate system-related decisions. With new technology to identify and isolate faults, grid operators will be able to</p>

Subproject 4: Advanced Metering Infrastructure (AMI)	
	facilitate a rapid response, pinpointing the problems in the grid and restoring power much more quickly. It will also allow user and utility to have a granular view of their power consumption data as well as enable smart buildings and demand load management.

Subproject 5: Meter Data Management	
Background / Reason	The City's existing outdated technology is unable to store sufficient data or produce the desired benefits of new technology available in modern AMI systems. The CLWBU's current metering system currently experiences significant and regular hardware failures. The existing system needs to be entirely replaced. Additionally, in our current system operations are frequently impacted by weather events, outages or partial outages, resulting in inaccurate information on system status and loss of historical information needed for energy efficiency analysis on behalf of our customers.
Description of Tasks	Install a new Meter Data Management and Control system with the above capabilities.
Grid Outcomes	Provide information between system operators and consumers. Besides improving outage identification and restoration times, the AMI will provide accurate real-time consumption data to aid in energy conservation measures. The addition of an MDM system will improve grid-related decision-making based upon historical and real-time system data. An MDM system will collect, organize and retain all valuable data points over a period of multiple years to facilitate more efficient and accurate grid-related decisions, as well as customer decisions on which energy conservation initiatives are most beneficial for them to implement in their homes and businesses. With an updated AMI and MDM system, energy use at homes and businesses could more easily be categorized, analyzed, and retained for continuous improvement processes related to not only energy efficiency but also utility system reliability, power quality, and system operation. The system will then be used to enable time of use rates and EV charging rates to provide the most efficient use of electricity, including increasing amounts of renewable energy supplies the CLWBU has contracted to purchase.

FEASIBILITY. The City has implemented limited test cases of the above projects, gaining valuable expertise on installation, implementation, testing, and operations. As such, all of the proposed upgrades are extremely feasible with appropriate funding and are ready to be scaled up. Existing staff are a skilled workforce capable of training the proposed new hires (see CBP) and providing valuable career paths for them and the proposed apprentices in a variety of quality jobs. The table below identifies the measures already taken and the ways in which our team has prepared for efficiently implementing large-scale upgrades. As the proposed subprojects would be installed on the City's existing distribution infrastructure, all the necessary knowledge of the infrastructure requirements and rights of way are established (with potential minor modifications such as to allow installation of fiber in a secured ROW).

FEASIBILITY – Previous Work Done and Prior Results		
1	Sectionalizing Devices	The City has already installed about one dozen reclosers that are directly connected over a low frequency radio system to our SCADA network. City technicians handle the devices from planning to implementation, including settings, installation, testing and commissioning. The City has already seen an improvement in our reliability indexes by installing smarter devices. The reclosers already installed have dramatically shrunk the outage locations and helped provide mesh power flow capabilities. These initial results indicate that fully implementing this project will result in greatly improved functionality and system reliability. The addition of reclosers at all of our switch locations system-wide would require a much larger effort, involving upwards of 100 reclosers, equally as many

FEASIBILITY – Previous Work Done and Prior Results		
		sectionalizers for laterals, and sensors for detailed control point data to monitor the individual circuits closer for expanded solar capabilities, EV charging requests for capacity limitations, community initiatives for renewable energy that might affect the grid both from a live monitoring perspective and future planning. The physical locations of these devices would be prioritized by impact to the community.
2	Fiber Optic Connections	Several fiber optic lines have already been installed by city technicians, and although most of the work remains to be done, the city has the expertise to complete fiber optic installation with GRIP funding.
3	Interconnection and Battery Storage for Community Solar	The feasibility of these projects would typically be dependent on the land owned or leased and knowledge of implementing solar and battery technology. We own our land in the city and are able to ensure permitting and approvals goes through a quick and smooth process.
4	Advanced Metering Infrastructure	The City currently utilizes a standalone AMI system, and is familiar with this kind of technology. Additionally, due to a recent upgrade of the City's Outage Management System (OMS), our City employees have developed an equally impressive knowledge-base of backend functions such as Application Programming Interface (API) to facilitate the necessary integrations.
5	Meter Data Management	The installation of a Meter Data Management System (MDMS) would be extremely feasible for the City. As these systems are primarily offered in a turnkey software as a solution (SAAS) package, along with the City's experience and knowledge base regarding associated integrations, we foresee no major obstacles in the implementation of an MDMS.

Innovation and Impacts. The project innovates in important ways, providing an overhaul in grid visibility, measurement, and resiliency as well as expanding existing infrastructure. The City recognizes that the problems with its grid are due in large part to an aged design from well over fifty years ago that lacked focus on reliability for its residents compared to neighboring systems, and partly from aging equipment, and the proposal addresses both factors. The innovation of this project is that it brings advanced metering and management technology to this outdated grid, bringing the functionality to a DAC that has suffered poor service and reliability due to lack of community resources. It will also provide a means for the City to centralize its measurement and reporting protocols, data collection, and ability to respond to threats to the grid. Thus, the smart grid system will not only allow improved day to day management but will enable a small, disadvantaged community to have tools that can help it manage repairs and upgrades into the future. The impacts benefit both the City of Lake Worth Beach as a whole and its individual customers. With additional electric delivery capacity and the ability to isolate faults, power outages will be rarer and less severe.

Further Deployment and Private Sector Investments

Through local conferences and media, the project will benefit neighboring communities and catalyze private sector deployment. The City will organize conference presentations and newsletter articles through two regional bodies, Florida Municipal Power Agency (FMPA) and the Florida Reliability Coordinating Council (FRCC), to engage other municipalities and inform them of the progress of Lake Worth Beach's infrastructure updates.

Reliable electricity will also catalyze private investment. The City will pursue media appearances with CNN and Palm Beach Post, following up on recent coverage of iguana encroachment on its

power lines, to demonstrate how it was able to leverage municipal bonds and grant funding to create a newly reliable smart grid and improve the City as a place to do business. The City is actively involved with the Florida Redevelopment Association, and will also use it to map out a strategy to attract more businesses. Additionally, its existing EV charging stations will be more reliable with the fault and outage mitigation detailed in this proposal, creating a desirable place for tourists with electric vehicles.

Support of Resilience, Decarbonization and other Energy Goals. The proposed project will substantially advance regional resilience, decarbonization, and renewable energy goals, particularly through enabling expansion of existing grid edge solar energy projects, such as EV charging stations. Combined with our contracted purchases of solar energy, it would allow our solar capacity to meet large amounts of our maximum summer load, transforming Lake Worth Beach into a majority renewable energy city in the coming years. In order to supplement the additional solar capacity, our long-range plans are to build energy storage to support the grid at night and during emergencies. By increasing grid functionality and efficiency, the proposed project will enable the retirement of a City-owned fossil fuel plant. Additionally, the increased power delivery options using reclosers and sectionalizers will make the local grid more resilient and provide quicker recovery from natural disasters, animal and vegetation contacts, and man-made events such as motor vehicle accidents.

Perceived Risk, Further Deployment and Private Sector Investments. The City has established protocols to mitigate the risk of introducing new technologies through its work breakdown structure and SMART goals. Essential to risk mitigation is engineering analysis, advance testing of new products, and outside assessments, all of which are included in the Workplan below. The project also comes with significant benefits, especially the potential for further deployment and private investment. It is expected that the proposal will catalyze private investment in several forms, particularly through increasing tourism and business development as the city sheds its reputation for poor electric reliability. The City can also serve as a model for other DACs, showing how commitment to local funding of improvements (the City's bond issues) can catalyze improvements at scale that are transformative. Leveraging of City funds will demonstrate the value of investments in municipal bonds smart functionality of local energy systems.

Development of Smart Grid Functions. The project introduces innovative approaches to using smart grid devices to overhaul an entire grid and provide tools for the City to respond to outages effectively. The grid outcomes described in the above tables for each subproject detail the smart grid functions that will be incorporated in the City's distribution system. By providing an electrical grid that integrates sensors, data, and enhanced transmission and security, the proposal offers a pathway for combining several different new technologies into a single comprehensive system with the capability to weather severe storms, forecast power usage, isolate problems, and improve the City's ability to provide reliable service to its residents.

Enhanced System Flexibility

A fully funded *SHRIP* will transform the local grid's flexibility, increasing transfer capacity between regions of the electric grid and reducing disruptions that serve critical loads in the community

such as health care, education institutions, local businesses and consistent internet access for disadvantaged community members.

Workplan:

Project Objectives:

The City has created a thorough, well-regulated plan to ensure efficient use of funds. Using the SMART guidelines (Specific, Measurable, Achievable, Relevant, Timely) described in the announcement, the City has outlined the tasks to be performed, milestones to mark progress, the measures needed to gather equipment and personnel, critical path and close correlation between projects and the goals of the FOA, and a strict timeline. As described further in the Technical Qualifications and Resources section, the City also has a capable group of project managers and subject experts on hand who will oversee the upgrades.

The project's infrastructure objectives are:

- Improve transmission reliability and limit the effects of outages.
- Enhance secure communication and data flow between distribution components;
- Provide interconnection and battery storage for its existing solar and green energy initiatives;
- Improve grid visibility and condition; and
- Improve grid-related decision making based upon historical and real-time system data.

Technical Scope Summary:

The proposal integrates smart grid devices throughout Lake Worth Beach's grid for effective and reliable transmission, fault isolation data monitoring, over a period of five years, divided into five 12-month budget periods. The tasks involved in carrying out the project consist of the following categories. Outreach and engagement tasks are described in the Community Benefits Plan.

- Complete project planning and management
- Develop and implement a comprehensive Community Benefits Plan that ensures the integration of Lake Worth Beach's disadvantaged communities into decision-making, workforce participation, and vendor bids.
- Secure permitting and right-of-way permit for all projects where necessary.
- Conduct engineering surveys and analyses.
- Procure materials for each of the respective subtasks.
- Solicit and finalize construction services and engineering bids.
- Complete the construction of all five subtasks.

The Work Breakdown Structure below highlights the procedure for ensuring that the community is informed and actively participating in the process. A visualization of each phase of the tasks is available under the Project Schedule.

Work Breakdown Structure and Task Description Summary:

The work is divided into eight tasks, executing on each subproject simultaneously. The descriptions of each task, along with the quarter in which they will be completed follow.

1.0: Project Management and Planning

Q1 – Subtask 1.1 – Project Management Plan (PMP):

Per the FOA, Lake Worth Beach will submit a Project Management Plan within the first 30 days of being granted the award and update as necessary throughout the project.

Q2 – Subtask 1.2: National Environmental Policy Act (NEPA) Compliance

As required, Lake Worth Beach shall provide the documentation necessary for NEPA compliance.

Q3 – 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. Lake Worth Beach intends to hire a dedicated cybersecurity expert to evaluate its system and implement changes.

Subtask 1.4: Continuation Briefing(s):

Lake Worth Beach 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).

Q4 – GO/NO GO Metric – The project's first go/no-go decision point will depend on DOE approval of Lake Worth Beach's NEPA compliance documentation.

Task 2.0: Procurement of Engineering Services

Lake Worth Beach will solicit bids from competitively procured pre-qualified list of engineering service providers and award engineering services contract. This task begins the critical path for development and implementation of the subprojects.

Subtask 2.1 – Solicit bids from competitively procured pre-qualified list of engineering service providers and award engineering services contract.

Q5 – Develop procurement documents.

Q6 – Solicit and award bids.

Task 3.0: Engineering and Bid Documents

Complete engineering documents for Subprojects 1-3 and bid documents for Subprojects 1–5.

Subtask 3.1 – Complete preliminary plans for Subprojects 1-3. This subtask is on the critical path, as it leads to obtaining permits and rights of way.

Subtask 3.2 – Complete final engineering plans, specifications and bid documents.

Completion of bid documents is the next step on the critical path for development and implementation of the subprojects, but cannot be completed until permits and ROW are secure.

Q7 – Complete preliminary engineering design

Q8 – GO/NO GO Metric – 100% of projects determined feasible from engineering perspective.

SMART Milestone: Complete final engineering design.

Q9 – Complete bid packages once permits and ROW are obtained.

Task 4.0: Permitting and Right of Way:

Complete permitting for Subprojects 2 and 3. No permits are required for Subprojects 1, 4, 5.

Subtask 4.1 – Obtain the following permits if deemed necessary by the issuing agency: right of way access from Florida Department of Transportation and/or Palm Beach

- County; and electrical building permit for Subproject 5.
- Q6** – Initiate all permit applications for modifying electrical infrastructure.
- Q9** – **GO/NO GO Metric** – 100% of permits and ROW obtained.

SMART Milestone: Complete permitting.

Task 5.0: Materials Acquisition

Procure materials for project that have long lead time items. Lake Worth Beach plans to order all equipment and materials in the first year, but supply chain delays may mean that some projects will only be able to be completed by the end of the project. This task will occur in parallel with the critical path for development and implementation of the subprojects, but is vital to initiate as soon in the project schedule as possible.

Subtask 5.1 – Order materials.

Q2 – Begin materials orders

Q12 - SMART Milestone: All materials ordered.

Subtask 5.2 – Receive materials

Q4 – Receive materials for Subtask 7.1, Sectionalizing Devices

Q7 – Receive materials for Subtask 7.3, Interconnection and Battery Storage for Community Solar

Q10 – Receive first shipment of materials for Subtask 7.4, Advanced Metering Infrastructure

Q11 – Receive software for Subtask 7.5, Meter Data Management

Q14 – Receive materials for Subtask 7.2, Fiber Optic Connections

Q16 – Receive all materials for Subtask 7.4, Advanced Metering Infrastructure.

SMART Milestone: All materials received to complete tasks by end of Q20.

Task 6.0: Procurement of Construction Services

Complete competitive procurement of construction services for all Subprojects. Award of construction contracts is the final step in the critical path for development and implementation of the subprojects, after which construction can begin.

Subtask 6.1 – Issue request for proposals to pre-qualified list of vendors. Evaluate responses and award contracts.

Q9 – 100% of bids received within budget.

Task 7.0: Construction (5 subprojects)

Complete construction and provide documentation.

Subtask 7.1 – Sectionalizing Devices

Q15 – Install half of sectionalizing devices.

Q20 – Complete installation of the sectionalizing devices and provide commissioning report.

Subtask 7.2 – Fiber Optic Connections

Q17 – Complete installation of fiber optic cable.

Q20 – Provide commissioning report on fiber optics.

Subtask 7.3 – Interconnection and Battery Storage for Community Solar

Q20 – Complete solar interconnections and provide commissioning report.

Q20 – Finish upgrade of interconnection and battery storage for community solar

Subtask 7.4 – Advanced Metering Infrastructure

Install Advanced Metering Infrastructure and provide commissioning report.

Subtask 7.5 – Meter Data Management

Install a Meter Data Management System and provide commissioning report.

Q13 – Complete half of meter installs.

Q20 – SMART Milestone: Finish meter installs, test, and activate system.

Task 8.0 – Project results dissemination

Disseminate results of project to small utilities and the media in Florida.

Subtask 8.1 – City will develop and provide presentations to organizations such as the Florida Municipal Power Agency and the Florida Reliability on project results and potential for deployment of similar upgrade efforts by municipal utilities.

Subtask 8.2. – City will develop press releases and other media on the success of its bond issuances to catalyze private sector investment in a disadvantaged community electric distribution system.

Q18 – Begin compiling project results for dissemination

Q19 – Materials ready to disseminate.

Deliverables to demonstrate interim progress:

Subtask 1.1 –Project Management Plan will establish that the team has procures in place to execute the project in scope, on time and on budget.

Subtask 1.3 – Cybersecurity Plan will establish requirements that will guide critical aspects of smart grid technology installation.

Subtask 1.4 – Pre-Continuation Briefing Document(s) will provide continued communication with DOE.

Subtask 3.1 – Executed Engineering Contracts will initiate the key first step in development of the subprojects.

Subtask 3.2 – Final Plans and Specifications will set the technical requirements for construction contract bidders.

Subtask 4.1 – Executed Permits will show authorization to construct the project.

Subtask 5.2. – Receipt of Materials will show that materials are in place to allow subprojects to proceed.

Subtask 6.1. – Executed Contracts will document the final step to allow construction to begin.

Milestone Summary:

The City has designated quarterly milestones to ensure that projects remain on track, along with annual SMART (Specific, Measurable, Achievable, Relevant, Timely) milestones. These include:

Milestone Summary Table					
Qtr.	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5
1	Submittal of PMP.	Develop procurement documents. Receive first shipment of materials for Subtask 7.4, Advanced Metering Infrastructure. .	SMART Milestone – Complete permitting. All bids received within budget.	Complete half of AMI meter installs	Complete installation of fiber optics
2	Submittal of information for NEPA. Begin materials orders.	Solicit and award bids. Initiate all permit applications.	Receive first shipment of materials for Subtask 7.4, Advanced Metering Infrastructure	Receive materials for 7.2 Fiber Optics	Begin compiling project results for dissemination
3	Update cybersecurity plan.	Complete preliminary engineering design. Receive materials for Subtask 7.3, Interconnection and Battery Storage for Community Solar	Receive software for Subtask 7.5, Metering Data Management.	Install half of sectionalizing devices	Materials ready to disseminate
4	SMART Milestone – DOE determination of level of NEPA analysis. Receive materials for 7.1 Sectionalizing Devices	Receive materials for Subtask 7.2, Fiber Optic connections. SMART Milestone - all projects determined feasible from engineering perspective.	SMART Milestone – All materials ordered.	SMART Milestone – All materials received to complete tasks by end of Q20.	SMART Milestone: Finish meter installs, test, and activate system.

Go/No-Go Decision Points:

The following decision points are designated Go/No-Go. These correspond with the SMART milestones which occur once per budget period:

Month 12: DOE approval of NEPA compliance.

Month 24: All projects determined feasible from engineering perspective.

Month 36: All materials ordered.

Month 48: All materials received to complete tasks by end of Q20.

Month 60: Finish meter installs, test, and activate system.

End of Project Goal:

By the end of the project, the available funding made possible for smart grid upgrades by the DOE GRIP grant will yield the following tangible outcomes:

- Damaged circuits will have diminished impact and be restored quicker, and grid operators will be able to restore power quickly in the event of an outage.
- Improved security for grid data transmissions and additional protection against cyberattacks and domestic terror threats. In addition to the fiber optic communications upgrade, the City will hire a cybersecurity specialist to develop additional defenses and countermeasures.
- Interconnection of existing grid edge solar project which will increase the availability of carbon-free energy to the grid.
- Improved grid visibility in SCADA and distribution controls systems for rapid or automated load rebalancing, fault isolation, and repair.
- New STEM jobs will be made available to the local community.

Buy America Requirements for Infrastructure Projects:

The City's procurement department has already committed to buy America prior to applying for this grant. In keeping with federal requirements, RFP's for all work involved in this project will stipulate that all vendors and subcontractors will be obligated to use American materials and labor.

Project Management:

The PMO manages the project through joint activities with the following departments: Utility Services, Materials Management, Transmission and Distribution Engineering and Energy Delivery Management. The activities include walkdowns to inspect all required aspects, bi-weekly timesheet conformance, monthly budget alignment and reconciliation, and field inspections to verify work to plan alignment and schedule adherence. These guidelines will provide accountability for project progression and funding and provide advanced warning if labor or costs do not appear to meet projected goals.

Approach to managing the work

The project will be managed by the City of Lake Worth Beach, with responsibilities for day-to-day tasks divided between the electric utility and their subcontractors. Regular reports and inspections by the Project Management Office will ensure that the project meets civic, public, and grant approval. Interdepartmental meetings will be held on a regular basis (to be defined in the Project Management Plan, PMP). The PMP will establish procedures for tracking progress, achievement of milestones, adherence to budget and managing change. Additional management procedures are provided in the section below for risk management.

Roles of each team member

The City's Project Manager, Marcel Korman, will oversee the progression of the project and delegate responsibility to various offices throughout. He will serve as the DOE contact for technical aspects of the project and will coordinate with utility staff as needed to provide DOE with timely and accurate information. Ed Liberty, the head of City utility, will direct the work, overseeing the utility's role in the project and supervising technical work.

Project Schedule:

Work Breakdown ACTIVITY	DESCRIPTION	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
	PROJECT MANAGEMENT AND PLANNING																				
Subtask 1.1	Project Mangement Plan	1.1																			
Subtask 1.2	NEPA Compliance			1.2																	
Subtask 1.3	Cybersecurity Plan			1.3																	
Subtask 1.4	Continuation Briefings			1.4				1.4				1.4				1.4				1.4	
	PROCUREMENT OF ENGINEERING SERVICES																				
Subtask 2.1	Develop procurement documents				2.1																
Subtask 2.2	Solicit bids and award contracts					2.2															
	ENGINEERING AND BID DOCUMENTS																				
Subtask 3.1	Complete preliminary plans						3.1														
Subtask 3.2	Complete final plans, specs and bid docs							3.2													
	PERMITTING AND RIGHT OF WAY																				
Subtask 4.1	Obtain permits								4.1												
	MATERIALS ACQUISITION																				
Subtask 5.1	Order materials											5.1									
Subtask 5.2	Receive materials															5.2					
	PROCUREMENT OF CONSTRUCTION SERVICES																				
Subtask 6.1	Issue request for proposals to vendors								6.1												
	CONSTRUCTION																				
Subtask 7.1	Sectionalizing Devices																			7.1	
Subtask 7.2	Fiber Optic Connections																			7.2	
Subtask 7.3	Interconnection and Battery Storage for Community Solar																			7.3	
Subtask 7.4	Advanced Metering Infrastructure																			7.4	
Subtask 7.5	Meter Data Management																			7.5	
	PROJECT RESULTS DISSEMINATION																				
Subtask 8.1	Presentations to local organizations																			8.1	
Subtask 8.2	Press releases and other media																			8.2	

Smart Milestones marked in red in Q4, Q8, Q12, Q16, Q20

Roles of each team member, cont'd

David Martyniuk will oversee the engineering analyses. Thomas McKee will provide vendor and supplier sourcing. David Martyniuk will oversee the contractors for each of the five subprojects, with Mike Jenkins specializing in electrical line work. Miglena Hooks will be responsible for cybersecurity upgrades. Finally, Ashley Sirdar will be responsible for budgeting city and grant funds and submitting grant reports, supported by Grant Management Associates and GrantWorks. Ashley Sirdar will coordinate with the Project Manager to document progress and comply with DOE reporting requirements. This team will be led by an experienced project manager who is a licensed contractor with experience in construction (including fiber optics) and a certified energy manager. Utility technical staff will work with the project manager to ensure that engineering and construction are performed as needed for the utility system. Three contractors have been competitively procured to a pre-qualified list to perform grid upgrades and conduit installation, with Letters of Commitment provided. They will be contracted through a Request for Proposals (Subtask 6.10).

Critical handoffs/interdependencies

The Project Manager will be responsible for interdepartmental coordination and adherence to scope and timelines. Within 60 days of approval by City officials, the engineering design will be sent to all relevant departments. Within 45 days of receipt of the engineering design, representatives from the following internal departments review the design and provide feedback or acceptance: Project Management Office (PMO), Utility Services, Materials Management, Transmission and Distribution Engineering, and Energy Delivery Management. Upon acceptance, engineering plans/bid documents can be issued through the city's procurement office. When contracts are awarded and executed by the City's contracts office, construction can begin, with regular review by the PMO and necessary staff.

Technical and management aspects of the plan, including systems and practices

The project involves community, technical, and logistical coordination. Following the Project Schedule outlined above, the City will solicit public opinion and community feedback throughout. As much as possible, the project will proceed with community benefits considered at every step, including recruiting local labor when possible. The technical aspects will be confirmed through engineering analyses. The logistical aspects of the project, including vetting potential vendors and suppliers, will be managed by City officials using existing relationships and building new ties with local small businesses.

Project risk management

The City has anticipated five potential risks to its proposal and prepared for them as follows.

Risk	Mitigation
Supply chain delays	Materials ordering will begin in Quarter 2 to anticipate potential delays
Finding a qualified workforce	The City will recruit from local technical schools, unions, and existing contractors.
Labor disputes	The City has established CBA's with both city and contractual workers.

Permitting issues	The City will address permitting and right of way early in the process
Budget overrun	The City has capacity to absorb overrun in its bond funding.

Changes to project management

No changes to project management are anticipated, but in the event that personnel are unable to continue in their role, the responsibility for their tasks will be reassigned by the PMO in consultation with City utility.

Quality assurance/control

The City will conduct monthly surveys and quarterly re-examination of progress towards the goals outlined in this plan. In accordance with establishment and adoption of the Utility Enterprise Financial policies of the comprehensive multi-year financial planning, a formal engineering review of the systems assets and planned capital investments will be performed at least every three years. The results of the engineering review will be used to determine the need for additional non-federal private investments.

How communications will be maintained

All City communication will be conducted by email, including document transfer and office approvals, phone, or in-person meeting. Communication protocols will be detailed on the PMP. Documents will be filed according to existing City practices, following protocols to ensure security and rapid retrieval if needed.

Technical Qualifications and Resources:

Team's Unique Qualifications and Expertise. The City's in-house team consists of project managers, directors, subject matter experts, engineers. Together, they boast more than 100 years of collective experience and have successfully managed millions of dollars of projects since 2020. Thanks to the SHRIP program, (System Hardening and Reliability Improvement Program) the team has already successfully managed grid upgrade projects at a large scale and navigated many of the difficulties inherent in rebuilding an aged electrical infrastructure while maintaining electric delivery operations. The team has extensive experience in the technical and managerial challenges of the project, an in-depth understanding of the problems and demands of the needed repairs, and the skill and experience needed to successfully execute the project plan. The eight key members of the Lake Worth Beach team bring to the projects associated with this grant proposal a wealth of unique qualifications, expertise, and decades of experience:

Ed Liberty has over 40 years in the energy sector and has served as the Electric Utility Director for the City of Lake Worth Beach since August 2017. In this role, he leads all aspects of the electric utility's operations and business activities, including energy procurement and resource planning, power generation operations, transmission and distribution operations, materials management, revenue protection, and management of the City's customer service operations. Mr. Liberty also serves on the boards of the Florida Municipal Power Agency, the Florida Municipal Electric Association and Florida Gas Utility as the City's representative.

Brian King is the Assistant Director of Electric Utilities. He brings more than 10 years' experience managing large-scale projects, including renegotiating power purchases and coordinating a diversified energy portfolio. He is also a member of the Florida Electric Power Coordinating Group and the Orlando Utilities Commission.

Thomas McKee has 15 years in Materials Management, engineering, and operations functions at electrical utilities and has worked for the City for a number of years. Mr. McKee has focused on projects that require materials demand planning, logistics, warehousing, supply chain coordination, minority-owned and woman-owned vendor sourcing where possible. Thomas has also developed an expansive list of vendors to mitigate the current supply chain disruptions.

Mike Jenkins will be a key component on the project team, with over 40 years of experience in the Electric Utility industry. Mr. Jenkins has worked for the City for many years and currently oversees all of the energy delivery functions of the City of Lake Worth Beach. He also has extensive prior experience managing projects of various size and scope. Mr. Jenkins is also a certified lineman apprentice instructor with Associated Builders and Contractors, Inc as well as a Journeyman Lineman.

David Martyniuk has nearly 10 years of experience in managing utility projects of similar scope and complexity. In addition to the Lake Worth Beach Utility projects, David also managed a number of related power systems at Keys Energy before coming to Lake Worth Beach in 2019. The projects were similar in size/scope to the project proposed herein, included DEIA components, and achieved all their objectives including completion on time and within budget.

Marcel Korman has 30 years of extensive and diverse industry experience in smart-city networks, MEP infrastructure, and multi-family projects with industry leading companies. He joined the City as Manager, Project Management Office. Focused on integrating and aligning transformative engineering strategy with facility management in achieving high quality, cost effective projects that drive sustainability initiatives, improving the human experience. He has been a key contributor to projects of scope and scale performing energy, water, and internet audits to align strategic metrics for sustainable utility cost reductions.

Jean St. Simon has served as an Electrical Distribution Engineer with the City since 2006. In this role he leads all aspects of the Distribution Engineering projects including technical design, electrical drawing review, underground and overhead replacement projects, as well as overseeing other engineering activities and requirements.

Miglana Tutova Hooks has a BS degree in Information Management, Cyber Security, and Network Assurance as well as several Cisco certifications that include Information Security. Related to her role in Lake Worth Beach's cybersecurity planning, Hooks has relevant experience in Cisco Firepower FTDs and FMC, ASAs Firewalls as well as FortiGate and PfSense, Cisco Catalyst series and Nexus 9000k switches; Dell 4810s, 3048s, Aruba L2 and L3 switches and SEL devices, and networking solutions including Cradlepoint, Ubiquity APs, and Mirakis.

Paul Nicholas is an accomplished mechanical engineering professional with extensive experience providing leadership and direction. His work in Lake Worth Beach involves oversight of the transmission system and collaborating with developers to ensure standards, cost, and schedule compliance of projects.

Ashley Sirdar has multiple engagements with the City. Her most recent achievement is earning a Bachelor's degree in Project Management from a local Lake Worth Beach-based university. Ashley had the foresight to enter the electric utility industry by accepting an internship with the City in 2021. Following her successful graduation, Ashley is now an incredibly resourceful Project Manager at the City, leading budgeting initiatives for the 2020 and 2022 Bonds, providing project activity and cost tracking the SHRIP project.

Susan Strachan is an experienced grant manager, having developed, funded and implemented over \$20M in grant awards at California State University Geographical Information Center. She was Project Manager and primary contact for the US Bureau of Reclamation for a \$17M award for salmon habitat restoration that involved construction and multiple subawards. She has also managed FEMA pass through funds through the California Office of Emergency Services, a Department of Justice award and US Fish and Wildlife awards.

Patrice Davis has over ten years' experience managing government funded projects, government grants, budgetary development and analysis skills, organizational policy development and implementation experience, and cross-departmental project leadership. Previous projects have included providing oversight for grants awarded by the National Science Foundation, National Institutes of Health, U.S. Army, private foundations, and corporations.

Equipment and Facilities. The City has sufficient facilities for this project's success. The City has developed and implemented processes to manage the work, has a unionized work force, and is prepared to train apprentices and additional team members as needed. Additionally, the City has in place or has design specifications / procurement processes / construction specifications for the work, and it has already ordered a lot of the equipment that it will need locally to accomplish the goals of the grant (*note: already-ordered equipment is not in this project's scope or budget*).

- **Warehouse / Storage.** The City has permanent access to approximately 20,000 square feet of indoor warehouse storage space and an additional 10 acres +/- of secured outdoor laydown sites at its main site. At its remote sites, it has another 40 acres (approx.) of area available for storage and operations. Among the main and remote sites, the City owns a dozen locked/secured Connex storage containers for its equipment, and both the main and remote sites are doubly secured by a 24-7 live-monitoring camera system.
- **Offices / Command Center.** In addition to these secured main and remote sites, the City has a Systems Operations center off-site (NERC requirement) with dedicated office space, including a wall board and a command center comprising real-time operators monitoring the network, and who have access to the City's 2-way radio system and satellite phones.

- **Equipment.** The City owns or has already ordered the following equipment: eight 55-ft bucket trucks with one more on order, three 40-ft bucket trucks, and one 44-ft bucket truck on order; six utility pick-up trucks for foremen and substation use); three digger derricks and one more on order; two forklifts with the expectation that additional forklifts of 15k capacity will be rented after grant approval; one flatbed truck; one backyard machine; and one mini-excavator.
- **Meter Shop.** The City has a meter shop with a meter test farm capable of testing up to 90 meters at a time installed on site as well as a meter test board, which will directly benefit the AMI project listed in the grant. The meter test farm is used to test meters prior to installation and to facilitate training the development of staff on new technology.
- **Radio System.** The City utilizes a 2-way city-wide Motorola radio system. This system is primarily used as primary communication channel between its base of operations and all employees and trucks/vehicles in the field, with personal cell phones as a backup.

Previous Work Efforts. The management team and unionized workforce are well-positioned to achieve the project objectives. Previous and ongoing work efforts include the entire range of technical work stipulated here: from updates and innovations to the grid's transmission capacities, substations, and distribution systems, the team has demonstrated its ability to achieve grant-related project goals as well as to innovate. The following tables describe in detail the City's current and previous/completed work:

TABLE 8 - Projects in Progress	
Category / Project Title	Status / Description
Transmission	In Progress
Transmission Line - Canal 138kV Switch Station	Transmission Line project
Transmission Line OPGW	New OPGW Canal to Main & Hypoluxo to Main
Main Yard Control House (TWN)	Eng. Design, purchase & install
Substation	In Progress
6th Ave S sub (6-bank station PB&Z, Survey & Design)	6th AVE South (H Street) Substation Design project
6th Ave S sub (6-bank station Materials & Construction)	7th AVE South (H Street) Substation Construction projects
Main Yard Buss Insulators & Switch Replacement	Main Yard Buss, Switch, Insulator replacement
New Canal 8 Bay Substation (6001,6002,6003,6004)	New Canal 8-Bay Substation (6001,6002,60003,6004, 4DR01)
Substation Capacitor Banks (Main Yard)	Main Yard Capacitor Banks, Study, Eng, Materials & Install
Digital Gas Analysis Equipment from ABB for (4) large power transformers	Digital Gas Analyzer for XFMRS & SCADA
SEL FR12 Digital Fault Indicators (12 sets)	Fault Indicators
12th AVE SUB (Design & Construction)	R/R Existing 4kV with 26kV
Omicron Testing Equipment	New Substation Testing Equipment
Engineering Services Support	ECF Engineering Support @ 1900
Distribution	In Progress
7th AVE Circuits Constr. (0702,0703, 0704)	7th AVE Circuit Hardening & Voltage Conv. (LE Myers)

TABLE 8 - Projects in Progress	
Category / Project Title	Status / Description
Canal Feeder - Constr. (4DR01)	4DR01 - College Feed from Canal Hardening & Voltage Conversion (LE Myers)
6th AVE S. - Circuit Design (0601,0602,0604)	DESIGN - 6th AVE/H Street Substation Circuit Design, Constr. & Voltage Conversion
6th AVE S. - Circuit Materials & Construction (0601,0602,0604)	DESIGN - 6th AVE/H Street Substation Circuits Constr. & Materials
6th AVE S. - Circuit Design (0603 and 1200)	DESIGN -6th AVE/H Street Substation Circuits
6th AVE S. - Circuit Materials & Construction (0603 and 1200)	MATERIALS & CONSTRUCTION -6th AVE/H Street Substation Circuits
1W05 Phase 2 -Constr. RR Tracks 18th Ave N to 24th Ave N	1W05 Phase 2 Constr.
1W13/0704 Phase 2 - Constr.	1W13 Phase 2 - French Ave Relocate & Hardening
Beach Tie - New ICW crossing design, survey & Geotechnical	DESIGN - ICW crossing to Casino Complex
Beach Tie - New ICW crossing materials & construction	MATLS & CONSTR - ICW crossing to Casino Complex
Canal Sub Circuits - Hardening (6001,6003, 6004)	Canal Circuit Hardening (HOOPER)
Canal Sub Mods - Design (4DR01, 6001, 6003 & 6004 UG/Relocate @ Canal for New Sub)	Canal Circuit Hardening Design
Distribution Modeling & Trip Coordination	Arc Flash, Trip Coord. Modeling (1W05 First, Substation Arc Flash)
138kV Tie-Line Underbuild Distribution Circuits (6004 & 6003)	DESIGN - Distribution Underbuild on FP&L 138kV T-Line
138kV Tie-Line Underbuild Distribution Circuits Materials & Construction (6004 & 6003)	MATLS & CONSTR - Distribution Underbuild on FP&L 138kV T-Line
Undergrounding & Distribution Circuit Mods 5003, 0602, 0603	Undergrounding and loop feed for Gulfstream and Bryant Park Beach Tie
1W05 Phase 3- Design & Construction - UG Work (W05-E09-E06-3N11-3N12)	1W05 Phase 3 Design & Construction
1E09 & 1N11/0703 UG at 7th AVE N & I-95	E09 & 1N11/0703 UG at 7th AVE N & I-95
System Reclosers	Distribution System Reclosers
XPLE UG Cable Replacement @ various locations & Substations	XPLE UG Cable Replacement
12 AVE S Circuits	12th AVE Circuits (1201, 1202, 1203 & 1204)
New Main Yard Feeder 1W18	New Main Yard Feeder tie to 1W05/1E03

TABLE 9 - Completed Projects (SHRIP):	
Project Title	Description
138kv Tie-Line Static Line Repairs	138kv Static Line Repairs
Main Yard GT2 138kV Cable Replacement	138kV UG Cable Replacement
Underground 3S04 Circuit at FEC RR and 1st AVE S	Underground 3S04 Circuit at FEC RR and 1st AVE S
South Loop Conversion	0602 In-House Labor (O&M)
E08 & ABB Breaker Project	E08 Breaker Replacement and ABB Breaker Upgrades

EU/City Fiber & Communication	Fiber to CLWB Substations
7th AVE N Substation (Constr.)	7th AVE Sub Construction

The City has equipment procurement, consultants, and contractors on competitively procured existing contracts. If the City receives GRIP funding, we can quickly execute on these projects, but we do not have the funding to achieve them without DOE support.

Time Commitment of Key Members

All the key personnel identified in this proposal already work on implementing SHRIP and associated power infrastructure improvement. In the event of being awarded the grant, they will continue to dedicate 90-95% of their time to the project.

Technical Services Provided by DOE

No technical services will be provided by DOE.