

ENHANCING COMMUNITY RESILIENCE WITH THE GREEN POWER ON- DEMAND SYSTEM (GPODS)

A White Paper
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www.gogpods.org



Prepared By:
All Hazards Consortium



1. Executive Summary

This white paper explores the deployment of the Green Power On-Demand System (GPODS) as a multi-year, multi-state infrastructure initiative aimed at enhancing community resilience during extended electrical power outages. Such outages can result from a variety of causes, including human-made disasters, technological disruptions, and natural hazards, and they have cascading effects on communities, disrupting essential services known as Community Lifelines. Rural, underserved, and disadvantaged communities are particularly vulnerable, often relying heavily on public services and utilities to restore critical infrastructure and Community Lifelines.

In the last decade, the electric industry and the federal government have prioritized energy storage technology (such as batteries, cold storage, and more) due to the growing use of electricity. Uncertainty around building new power plants has made energy storage a critical part of their long-term plans. Billions of dollars are being invested in developing and using these energy storage solutions to enhance grid resilience and maintain a dependable power source.

The GPODS (Green Power On-Demand System) project focuses on deploying mobile, rechargeable energy storage units (batteries) connected to the utility distribution grid. These units can support the community's grid resilience year-round and be deployed during disasters to predetermined critical locations, ensuring an uninterrupted power supply. This white paper outlines the problem, describes the GPODS solution, highlights the collaborative effort driving the project, provides a status update, and emphasizes the resources provided by the All Hazards Consortium (AHC), the participating utility, and other project partners.

2. Introduction

In our modern world, prolonged power outages resulting from various crises pose a significant threat to all communities. These outages disrupt essential services vital to response, mitigation, and recovery efforts during and after emergencies. Vulnerable communities, such as those in rural, underserved, or disadvantaged areas, face acute challenges during power outages, often relying heavily on state and local government services, public safety officials, and utilities to restore critical infrastructure and Community Lifelines.

This white paper addresses these critical issues by introducing the Green Power On-Demand System (GPODS) initiative, a comprehensive approach to ensuring an uninterrupted power supply to underserved communities and essential infrastructure during emergencies. GPODS leverages energy storage technology to enhance community resilience, with a focus on collaboration, innovation, and long-term sustainability.

3. Problem Statement

Extended electrical power outages caused by human-made disasters, technological disruptions, and natural hazards can have devastating consequences. These outages disrupt essential Community Lifelines and services, including safety and security, health and medical, communications, food, water, shelter, power, and fuel. These services are vital for effective response, mitigation, and recovery efforts during major disasters or emergency incidents that produce significant temporary or long-term disruptions.

Rural, underserved, and disadvantaged communities bear a disproportionate burden during these power outages. They often rely heavily on state and local government services and utilities to restore critical infrastructure and Community Lifelines. However, inadequate critical infrastructure leaves these communities vulnerable, with limited access to health and medical services, transportation, food, water, and shelter. This makes them more susceptible to the impacts of widespread power outages, hindering their self-sufficiency during emergencies and their ability to recover effectively and swiftly.

Furthermore, the lack of power significantly affects the ability of public safety and emergency responders to assist in response and recovery efforts, straining their limited resources and increasing the potential for hardship and suffering among those in the community who most need assistance.

4. The GPODS Project Abstract

In 2020, the All Hazards Consortium's private sector leadership initiated the GPODS project, a multi-year, multi-state infrastructure initiative. This initiative aims to leverage the research and development funding and resources in the energy industry, in addition to the federal government's infrastructure funding sources (e.g. FEMA BRIC Infrastructure Grant, Department of Energy grants, or other federal funding sources for infrastructure). Large utilities and energy companies are investing billions in energy storage technology to prepare for a future increasingly dominated by electrification. As the prospects for building new generation plants become less promising, energy storage becomes a vital component of their strategy.

The GPODS project's initial focus is on rural, underserved, or disadvantaged communities, a requirement of the FEMA BRIC (Building Resilient Infrastructure and Communities) grant program. It centers on the development of mobile, rechargeable, commercial-grade energy storage units (e.g., batteries). These units can be connected to utility distribution grids on utility property, supporting local grid resilience year-round. During disasters, these units can be deployed, at the direction of government, to pre-qualified communities and connected to pre-qualified, "pre-wired" critical infrastructure or facilities. This deployment ensures that electric power remains available at critical facilities, including shelters, dialysis centers, local government buildings, and essential sites of critical infrastructure, such as water, communications, and fuel.



5. Addressing the Critical Community Needs

The GPODS project was conceived to address critical needs stemming from extended power outages in vulnerable communities. By providing backup electric power to underserved communities and critical infrastructure, this project seeks to mitigate the far-reaching impacts of power outages. Key needs include:

- Ensuring the availability of essential Community Lifelines during emergencies.
- Enhancing the resilience of the local distribution grid year-round.
- Supporting vulnerable communities in their quest for self-sufficiency during emergencies.
- Reducing negative health outcomes by ensuring access to critical services.
- Assisting public safety and emergency responders in their response and recovery efforts.

The GPODS project aligns with these needs and aims to create a more resilient and sustainable future for communities facing power outage challenges.

6. GPODS Project Overview

The GPODS project's goal is to create a resilient and reliable power supply that can help communities better cope with and recover from power outages, ensuring that essential services such as health care, water, transportation, communication, safety/security, feeding/cooling stations, and shelters can continue to operate. (www.gogpods.org).

The Green Power On-Demand System (GPODS) is a project that uses mobile rechargeable batteries to support the electrical grid in disadvantaged communities. These batteries can detach from the grid and be deployed to specific locations during natural disasters or other emergencies. Here's a simple breakdown of how it works:

GPODS Concept: GPODS will be managed jointly by state and local emergency managers, just like any other county resources. The utility company will own, operate, and maintain the GPODS system. When a mission is requested by the government, the utility will disconnect GPODS units from charging stations, transport them to pre-wired sites, and plug them in. Once the regular power is restored, GPODS will be disconnected by the utility and returned to the charging station or moved to another pre-wired site.

GPODS Maximized Utilization: GPODS units serve a dual purpose. During normal conditions, they make the community's power grid more efficient by storing and releasing energy 24x7. During emergencies with power outages, utilities can detach GPODS units and use them as backup power for pre-qualified facilities.

GPODS Safety: Safety is a top priority for all utilities and the government. The GPODS equipment is stored at the utility's site when not in use, reducing the time it's in the community. Quick-connect devices are installed by the utility outside pre-qualified facilities on utility property. NO GPODS equipment is installed in the facilities. This approach makes GPODS



operations safer and more efficient. Remote monitoring of GPODS equipment by the utility ensures safety, availability, and reliability.

Post-Grant Maintenance: After the grant period, the utility will continue to own, operate, and maintain the GPODS system as part of their normal infrastructure, relieving the maintenance burden from state and local governments.

Three-Phase Approach: The project comprises three implementation phases:

1. **Phase 1 - Scoping Project:** Determines feasibility and identifies qualified sites.
2. **Phase 2 - Pilot Project:** Deploys GPODS units and quick-connect devices at selected sites.
3. **Phase 3 - Implementation Project:** Expands to more communities with additional units and quick-connect devices.

Long-Term Vision: GPODS aims to expand across counties and states, supported by multiple utilities. This collaborative industry and government approach ensures that more communities can mitigate cascading power outages during disasters, making the power supply more resilient and efficient while coordinating resources in energy storage.

For more details, see Attachment 1 – GPODS Project Overview

7. Collaborative Effort for a Resilient Future

Public-Private Partnership: The GPODS project represents a unique collaboration between the public and private sectors. The All Hazards Consortium (AHC) and its private sector leadership are partnered with investor-owned electric utilities to drive this multi-year initiative. The GPODS project leverages partnerships with other organizations, such as non-profits, private sector companies, trade associations, academia, and other government agencies. These collaborations help leverage additional resources, align with other projects and research, develop in-kind matches, and attract expertise to implement the GPODS project over multiple years.

8. Current Status of the GPODS Projects

Maryland: The GPODS initiative in Maryland is in the early stages. One county has agreed to move forward with the Phase 1 – Scoping Project application in 2025. A second county is pending.

Delaware: Three (3) counties in Delaware were approved in 2023 for their Phase 1 – Scoping Project applications. Waiting for FEMA final approvals and funding to begin.

North Carolina: Three (3) counties in North Carolina were approved in 2023 for their Phase 1 – Scoping Project applications. Waiting for FEMA final approvals and funding to begin.



Pennsylvania: Westmoreland County was approved in 2023 for their Phase 1 – Scoping Project applications. Waiting for FEMA final approvals and funding to begin.

Virginia: In 2021, the Virginia Department of Emergency Management (VDEM) partnered with the All Hazards Consortium and Dominion Energy to initiate the first GPODS project.

Phase 1 - Scoping Project in Virginia (Awarded by FEMA March 2023): In January 2022, the All Hazards Consortium (AHC) collaborated with the Commonwealth of Virginia's Department of Emergency Management's Mitigation Grants teams and Dominion Energy to submit and secure a FEMA BRIC grant award for a Phase 1 Scoping Project. The objectives of this phase include:

1. Identifying underserved communities in Virginia, collaborating with VDEM and local, regional mitigation coordinators.
2. Identifying potential facilities within these communities that meet the technical criteria for participation in the GPODS program.
3. Developing Initial Frameworks, Processes, and Mechanisms for Program Governance, Management, Operations, and Maintenance.

Phase 2 - Pilot Project in Virginia (Selected by FEMA August 2023): The Phase 2 - Pilot Project was submitted in January 2023 with a budget exceeding \$20 million. This phase aims to deploy several GPODS trailers and establish multiple pre-wired locations in various Virginia areas, including Richmond, Colonial Heights, Petersburg, and Prince William County. These locations encompass critical infrastructure such as water pumping stations, dialysis centers, shelters, and city halls. FEMA selected the Phase 2 application for further review in August 2023, and the award is expected in 2024/2025.

Phase 3 - Implementation Project in Virginia (Submitted Jan 2024): The Phase 3 - Implementation Project is already underway and is expected to be a more extensive endeavor, with an estimated budget of \$45 million. This phase will cover multiple sites in Hampton, Chesapeake, and Charlottesville, Virginia, with the application submitted in Jan 2024.

9. Resources Provided by AHC & Partners

Resources Provided by AHC & Partners: The All Hazards Consortium (AHC), a Maryland-based nonprofit, boasts a 19-year history of fostering public-private partnerships and successfully securing and managing federal grants in collaboration with states. This includes the FEMA BRIC grant, a long-term infrastructure initiative. Recognizing that energy infrastructure projects are complex, have long development cycles, and often require resources and expertise that are far beyond the technical and financial capabilities of rural and underserved communities, the AHC's leadership has partnered with utilities and other stakeholders to underwrite the initial two years of work required to develop a winning, multi-phased project. Once implemented, the GPODS initiative will benefit participating communities for up to two decades.

Under the GPODS project, AHC, alongside its private sector partners and participating utilities, offers a range of resources and staff at no cost to state and local governments during the first two grant application cycles. These resources include experts in research, grant application writing, acquisition of support letters, business cost analysis, technical and engineering support,



communications and marketing, community outreach, partner management, and grant match development. This comprehensive support aims to facilitate the successful implementation of the GPODS project and ensure its long-term sustainability. **The GPODS project does NOT require any funding from state and local governments**, only their participation in the planning process and guidance during the application development process.

For more details, see Attachment 2 - Resources Provided by AHC & Partners.

10. Roles & Responsibilities

All Hazards Consortium

- Coordinate and manage all project partnerships.
- Initiate initial outreach and secure agreements with state/county and utility(s) to proceed with joint BRIC project application work (as needed).
- Facilitate the project with state/local and utility(s), oversee governance structure, manage meeting administration, document meeting notes, handle program management, conduct outreach to partners, and provide FOIA protection.
- Aggregation of grant required letter and documentation from partners and facility owners.
- Provide and oversee all grant writing needed to address the applications sections qualitative and quantitative information including costs/budgeting, BCA (Business Costs Analysis, etc....
- Assist in generating, producing, and tracking the "in-kind match" for the state.

Participating Utility:

Phase 1: Scoping Project

- Grant Application Development Phase:
 - Provide relevant outage history reports
- Implementation After Award”
 - N/A

Phase 2: Pilot Project

- Grant Application Development Phase:
 - Participate in project coordination meetings and governance structure
 - Support application development (briefings, research, cost/budgets, design, engineering, legal, regulatory, technical writing/editing, legal review, or other relevant application activities)
 - Answer technical questions or provide clarifications from FEMA post grant submittal
- Implementation After Award
 - budgeting, technical design, engineering, surveys, procurement, installation, operation, and ongoing maintenance of all GPODS-related equipment.
 -



- Provide all technical design, engineering, site surveys, RPF's for equipment, construction, installation, operations, and maintenance support for the GPODS system during the three year grant cycle and the long term maintenance as part of their utility infrastructure.
- Conduct technical reviews and surveys to qualify pre-wired locations.
- Engage in ongoing research and development of renewable energy technologies/solutions to support the project.
- Support the in-kind match development
- Support the project's outreach, communications, and partnership development.

State / County:

- Participate in project status meetings as needed.
- Support the process of selecting the communities/facilities to focus on for the project.
- Assist in AHC's partner development process by facilitating introductions to relevant organizations.
- Offer guidance and advice to the AHC in the grant application submittal process and governance framework.
- Submit the grant applications to State / FEMA of their timetables

11. Conclusion

The Green Power On-Demand System (GPODS) represents a groundbreaking initiative aimed at bolstering community and infrastructure resilience during prolonged electrical power outages. Recognizing the profound impact of these outages on critical services and vulnerable communities, the GPODS project focuses on the development of mobile, rechargeable energy storage units to effectively address these challenges and contribute to a more resilient future.

This white paper has provided a comprehensive overview of the problem at hand, elucidated the innovative GPODS solution, showcased the collaborative efforts propelling the project, furnished a status update, and underscored the invaluable resources generously offered by the All Hazards Consortium (AHC) and its partners. As the project advances through its various phases and extends its reach beyond the initial scope, it stands as a testament to the potential of public-private partnerships in crafting creative solutions that enhance community resilience and fortify their ability to endure and recover from disasters. In GPODS, we witness the embodiment of resilience in action.

Attachment 1 – GPODS Project Overview

The project, known as the Green Power On-Demand System (GPODS), will leverage a mobile rechargeable battery system. This system will support the electric grid of disadvantaged communities during normal conditions. However, it can detach and be deployed to predetermined and pre-wired facilities or critical infrastructure locations throughout the state to ensure continuous power or provide immediate backup during natural disasters or other catastrophic incidents, as depicted in **Figure 1** below.

GPODS vs Diesel Generators

The GPODS system differs significantly from traditional solutions such as stationary large diesel generators. GPODS reduces pollution, unlike diesel generators, as it uses batteries for power storage, emitting no pollutants. Furthermore, GPODS supports renewable energy sources by storing surplus energy generated from sources like wind and solar, which can be utilized during peak demand or power outages—something diesel generators cannot achieve.



Figure 1 - GPODS Unit

Mobile GPODS units can be shared across communities as needed, offering scalability without the need for expensive generators at every site. Instead of installing a stationary large diesel generator and interfaces at each location, the GPODS approach involves installing quick-connect devices at multiple sites. This allows more facilities and communities to participate in the GPODS program in the future.

Additionally, GPODS units can be used day-to-day to store and discharge energy, making the community's electrical grid more reliable and resilient during peak demand periods, which diesel generators cannot achieve. By utilizing GPODS, communities can better manage their energy consumption, reduce dependence on fossil fuels (a grant requirement), and provide a cleaner backup power solution during crises.

GPODS Concept of Operation

The GPODS system will be governed by a joint governance process, which is currently under development and will involve state and local emergency managers. The utility will own, operate, and maintain the GPODS system and execute approved GPODS missions following the governance process.

When a mission is requested, the utility will disconnect the GPODS unit(s) from the distribution grid charging stations, transport the unit(s) to the pre-wired site(s), and plug them into the GPODS quick-connect device(s). Once the grid power is restored, the GPODS will automatically disconnect from the facility. The utility will either return the GPODS unit to the charging station

or transport it to another pre-wired location based on pre-arranged parameters, which are currently in development (see Figure 2 below).

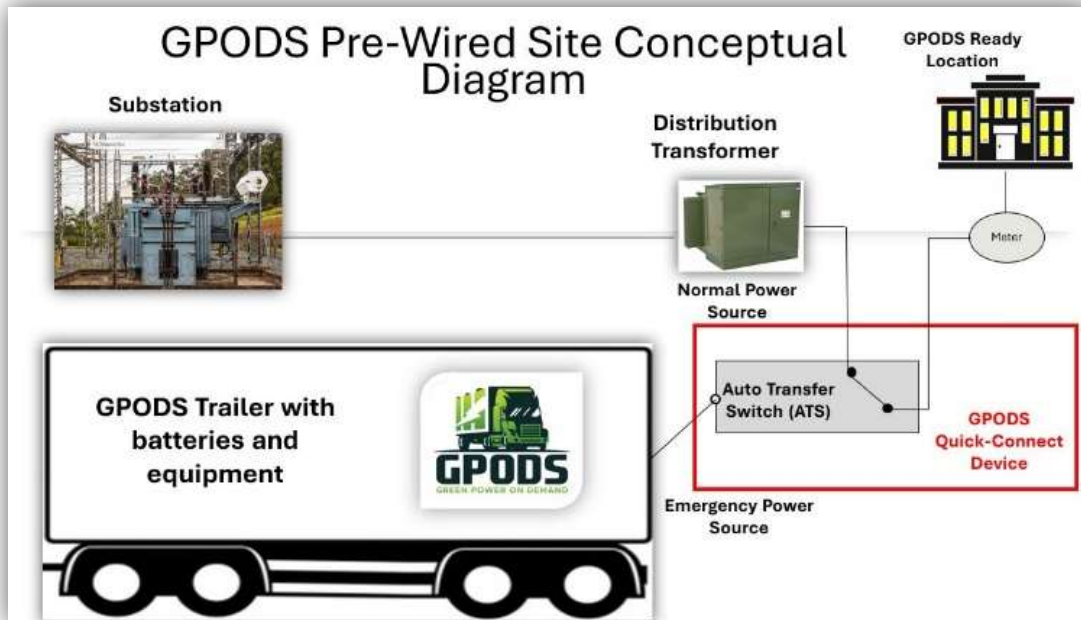


Figure 2 – Pre-Wired Site Diagram

Flexibility & Scalability

The GPODS project utilizes an innovative "distributed quick-connect approach" that involves installing standardized quick-connect devices at multiple pre-qualified sites. This creates a network of "GPODS ready" locations, allowing more community infrastructure, facilities, local communities, and states to participate in the GPODS program in the future (see Figure 3 below).

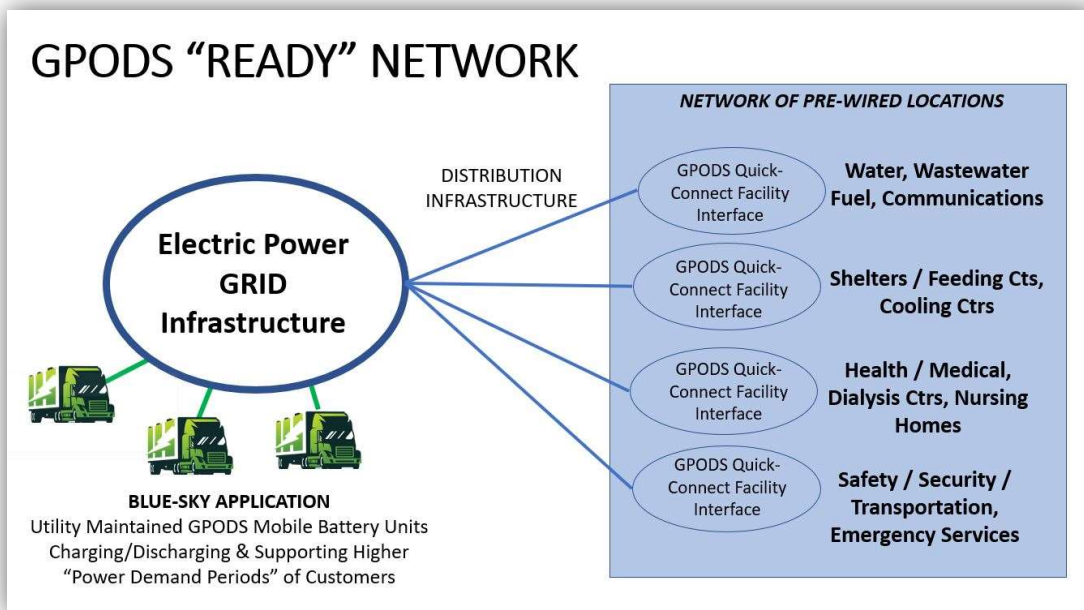


Figure 3 – GPODS "Ready" Network of Pre-Wired Sites

GPODS Maximized Utilization

The innovative mobile GPODS energy storage approach allows dual utilization of the GPODS units, maximizing risk reduction and resilience benefits to communities. Instead of a fixed asset like a large-scale diesel generator that may only provide benefits a limited number of times, GPODS mobile units are in use every day, serving two purposes:

1. During normal conditions, the GPODS system enhances the community's power grid by storing excess energy during non-peak hours and releasing it when demand exceeds normal availability. This strengthens the grid and ensures the effective use of existing and renewable energy sources throughout the year.
2. During emergency conditions with power outages, the utility, under the direction of the governance process, detaches the GPODS unit(s) from the grid and transports them to pre-wired location(s) to provide backup power.

This innovative "dual use" approach leverages energy storage technology and maximizes the investment and utilization of the GPODS mobile generators throughout the year (see Figure 4 below).

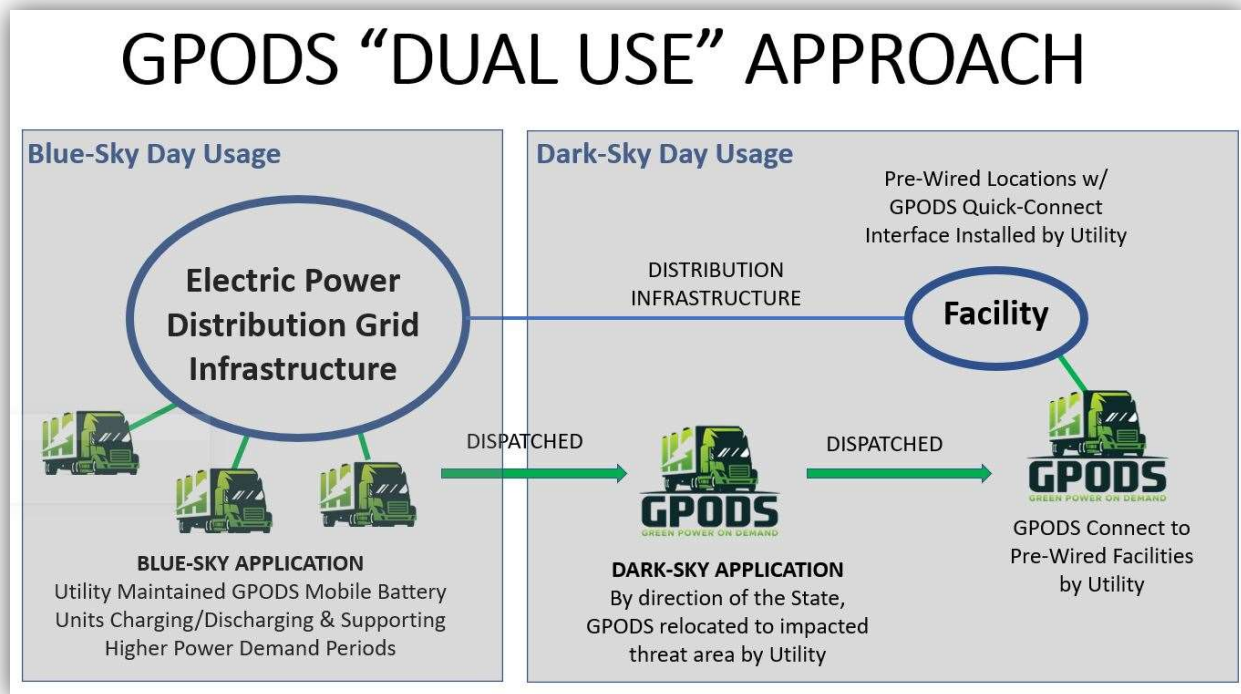


Figure 4 – GPODS Dual Use Approach

GPODS Safety

Safety is a top priority for all utilities, and the GPODS system has been designed to maximize safety and reduce risks associated with the GPODS energy storage units, charging stations, and quick-connect devices.

1. All GPODS equipment is stored at the utility's site when not in use, reducing the time GPODS battery units are in the community.



2. Quick-connect devices are installed by the utility outside qualified facilities on utility infrastructure, on the utility side of the power meter. These devices remain inactive unless the main power goes out and a GPODS unit is attached to them. There's no need to install **GPODS** equipment inside buildings, simplifying operations, enhancing safety, and reducing risks during deployments.
3. The GPODS and quick-connect devices will be continuously monitored remotely via the utility's operations centers to ensure operational safety, reliability, and minimize the risk of equipment malfunctions during power backup missions.

Post Grant GPODS Project Maintenance

Following the grant period, the utility will take ownership, operation, and maintenance responsibilities for the GPODS system as part of their infrastructure support costs. This relieves the long-term support burden on state and local governments.

The Three-Phase Approach

The GPODS project is a comprehensive initiative designed to enhance community resilience during extended power outages, encompassing three distinct phases, each contributing to the overall success of the project:

Phase 1 - Scoping Project:

The first phase focuses on determining the feasibility of communities and potential facilities, identifying qualified sites for the pilot project, and laying the foundation for subsequent project activities.

Phase 2 - Pilot Project:

This phase continues the activities initiated in Phase 1 and involves deploying GPODS units and quick-connect devices at selected pilot sites, ensuring technical compliance and long-term maintenance.

Phase 3 - Implementation Project:

The final phase encompasses the full-scale implementation of the initiative, deploying additional GPODS units to additional quick-connect devices within multiple communities, potentially ranging from 50 to 100 sites.

Long-Term GPODS Project Vision

The future vision for GPODS is inspired by the way utilities currently assist each other during major power outages, sharing resources across different regions, states, and counties. The GPODS project is designed to utilize standards and processes that can easily expand across county or state lines with participating utilities and states.

By coordinating funds from utility and federal investments in infrastructure and energy storage, GPODS units could be moved by multiple utilities into the County by participating utilities. This would help more communities during disasters, making the GPODS power supply more resilient and capable. It also spreads the costs, reduces the effects of climate change-related outages, and gives local emergency managers extra resources.



ATTACHMENT 2 - Resources Provided by AHC & Partners

The All Hazards Consortium, a Maryland-based 501c3 organization, boasts over 15 years of experience in facilitating public/private partnerships and successfully securing and executing federal grants in collaboration with states. The FEMA BRIC grant is just one example of our track record in this regard.

Recognizing that infrastructure projects come with long lead times and require a host of technical, legal, and regulatory resources, which are often beyond the reach of rural, disadvantaged, and underserved communities, the leadership at AHC has proactively forged partnerships with utilities and other stakeholders. These collaborations are aimed at underwriting the initial two-year effort required to develop a winning, multi-phased project that will bring lasting benefits to communities for up to 20 years.

Under the GPODS project, the All Hazards Consortium (AHC) team, working in tandem with its private sector partners and participating utilities, is committed to providing an array of resources and dedicated staff at no cost to state and local governments during the first two (2) grant application periods, scheduled for January 2024 and January 2025. Subsequently, the grant award will fund the implementation of the pilot project and future phases beyond that initial two-year period.

These resources include:

- **Researchers:** Experts tasked with compiling the legal, regulatory, and technical requirements necessary to establish the GPODS system in Maryland in collaboration with Exelon/PEPCO.
- **Grant Application Writers/Editors/Validators:** The AHC offers a dedicated team of 8 to 10 grant writers, editors, and reviewers to assist the County in navigating the grant application process.
- **Acquisition of Support Letters:** The AHC ensures the production and submission of FEMA Support Letters with grant applications, where applicable.
- **Business Cost Analysis (BCA):** The AHC provides support for BCA work, either directly or in collaboration with the County and State. For example, the AHC conducted the BCA for the Virginia project.
- **Technical/Engineering Support:** Resources are allocated to offer technical engineering expertise, design assistance, site surveys, and other critical activities to support grant applications and project implementations.
- **Communications and Marketing Support:** Resources are dedicated to developing an integrated project messaging strategy in close coordination with state, county government, and utility representatives. Notably, the joint development of the www.gogpods.org website serves as a platform for unified messaging.
- **Community & Partner Outreach:** Efforts are made to actively engage local communities and partners, providing timely education to enhance awareness and understanding of the GPODS project.



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- **Project and Partner Management:** Facilitation of weekly status meetings and provision of central coordination staff and systems to manage all project-related costs, timelines, implementation issues, labor matters, contractor management, coordination with DEV, outreach and communications, and other project-related tasks.
- **Match Development Services:** As the project management lead, the AHC provides the necessary support for developing the 25% grant match required by the FEMA BRIC grant, ensuring compliance with federal cost-sharing requirements.