Agenda Date: 6/30/17
Agenda Item: 9E

STATE OF NEW JERSEY

Board of Public Utilities
44 South Clinton Avenue, 3rd Floor, Suite 314
Post Office Box 350
Trenton, New Jersey 08625-0350
www.nj.gov/bpu/

MISCELLANEOUS

IN THE MATTER OF THE TOWN CENTER DER MICROGRID INCENTIVE PROGRAM AUTHORIZATION OF INCENTIVE FUNDING TO THE BOROUGH OF HIGHLAND PARK FOR PHASE I FEASIBILITY STUDY	))))	ORDER DOCKET NO. QO17060633

Parties of Record:

Gayle Brill Mittler, Mayor, The Borough of Highland Park

BY THE BOARD:

The 2015 New Jersey Energy Master Plan Update (EMP Update) established a new overarching goal to "Improve Energy Infrastructure Resiliency & Emergency Preparedness and Response" in response to several extreme weather events that left many people and businesses without power for extended periods of time. These new policy recommendations included the following:

1. Increase the use of microgrid technologies and applications for Distributed Energy Resources ("DER") to improve the grid's resiliency and reliability in the event of a major storm; and

2. The State should continue its work with the USDOE, the utilities, local and state governments and other strategic partners to identify, design and implement Town Center DER ("TC DER") microgrids to power critical facilities and services across the State.

At its November 30, 2016 agenda meeting Docket number QO16100967, the Board authorized the release of staff's Microgrid Report ("Report"). The following recommendations in the Report specifically address the development of a TC DER microgrid feasibility study incentive program and pilot:

1. Develop and implement a TC DER microgrid feasibility study incentive program as part of the current New Jersey Clean Energy Program ('NJCEP") budget. This TC DER microgrid feasibility study incentive program should provide funding for the upfront feasibility and engineering evaluation project development costs of

a Town Center TC DER microgrid at the local level. This incentive should be a phased approach beginning with an initial feasibility study, followed by detailed engineering design phase. Staff should implement a stakeholder process to determine the terms and conditions of the TC DER microgrid feasibility study incentive program. This incentive should be provided through an MOU structure.

2. Initiate a TC DER microgrid pilot within each electric distribution company ("EDC") service territory. This should initially be limited to the municipalities within the 9 Federal Emergency Management Agency ("FEMA") designated counties or municipalities that meet the same criteria identified in the New Jersey Institute of Technology ("NJIT") report. These pilots should include, at a minimum, an initial feasibility study of the TC DER microgrid. This process should assist in the development of a TC DER microgrid tariff.

On August 5, Board staff issued a TC DER microgrid feasibility study draft application for public comment. On August 23, 2016, a public meeting was held to discuss the draft application and written comments were received and considered in the final application. Board staff's responses to the comments were published as part of the release of final application.

At its January 25, 2017 agenda meeting Docket number QO16100967 the Board authorized the release of TC DER microgrid feasibility study application. Incentive funding was capped at $200,000 per feasibility study. The Board directed staff to release the application and to open a 60-day application submission window. Applications submitted during that period would be reviewed by Staff and selected on a competitive basis. Any application submitted after this time period would be accepted on a first-come-first-served basis subject to available fund. The 60 day period ended on March 27, 2017

Prior to March 27, 2017, The Borough of Highland Park submitted an application to the Board.

The Borough of Highland Park submitted a TC DER microgrid feasibility study incentive application entitled Being Resilient In Temporary Emergencies ("BRITE") Highland Park TC DER Feasibility Study will examine the potential of connecting the following critical facilities to a TC DER Microgrid: Borough Hall, Police and Fire Stations, two senior centers, the Housing Authority, the Bartle School and BOE Offices. The project represents approximately 1,349 MWh and 52,248 therms over 239,284 square feet ("sq. ft."). Additional sites may be evaluated for potential inclusion in the TCDER Microgrid. The applicant will evaluate most commercially-viable technologies, including but not limited to fuel cells, energy storage systems, solar, and combined heat and power ("CHP"). The current timeframe for completion of the study is approximately nine months.

After review of the application Board Staff recommends that the Board approve the above-referenced application.

The Board **HEREBY ORDERS** the approval of the aforementioned application for the total incentive amount of $130,000 for the Borough of Highland Park and **AUTHORIZES** the President of the Board to sign and execute the MOU attached hereto which sets forth the terms and conditions of the commitment of these funds.

This effective date of this order is July 10, 2017.

DATED: 6/30/17

BOARD OF PUBLIC UTILITIES
BY:

RICHARD S. MROZ
PRESIDENT

JOSEPH L. FIORDALISO
COMMISSIONER

MARY-ANNA HOLDEN
COMMISSIONER

DIANNE SOLOMON
COMMISSIONER

UPENDRA J. CHIVUKULA
COMMISSIONER

ATTEST:

IRENE KIM ASBURY
SECRETARY

I HEREBY CERTIFY that the within document is a true copy of the original in the files of the Board of Public Utilities

IN THE MATTER OF THE TOWN CENTER DER MICROGRID INCENTIVE PROGRAM AUTHORIZATION OF INCENTIVE FUNDING TO THE BOROUGH OF HIGHLAND PARK FOR PHASE I FEASIBILITY STUDY

SERVICE LIST

Mayor Gayle Brill Mittler
Borough of Highland Park
221 South 5th Avenue
Highland Park, NJ 08904
brillmittlerhp@gmail.com

Andrew Kuntz, DAG
Division of Law
124 Halsey Street
Post Office Box 45029
Newark, NJ 07101-45029
andrew.kuntz@law.njoag.gov

Board of Public Utilities
44 South Clinton Avenue, 3rd Floor, Suite 314
Post Office Box 350
Trenton, NJ 08625-0350

Irene Kim Asbury, Esq.
Secretary of the Board
Office of the Secretary
Irene.asbury@bpu.nj.gov

Michael Winka
Michael.winka@bpu.nj.gov

Marisa Slaten, Director
Economic Development & Energy Policy
marisa.slaten@bpu.nj.gov

Thomas Walker, Director
Division of Energy
Thomas.walker@bpu.nj.gov

James A. Boyd, Jr.
Counsel's Office
james.boyd@bpu.nj.gov

gabel associates

March 24, 2017

Michael Winka
New Jersey Board of Public Utilities
44 S. Clinton Avenue
Trenton, New Jersey 08625

RE: Transmittal Letter – Borough of Highland Park TC DER Microgrid Application

Mr. Winka:

On behalf of the Borough of Highland Park, Gabel Associates, Inc. is pleased to present this application in response to the New Jersey Board of Public Utilities (BPU) solicitation for feasibility studies of Town Center Distributed Energy Resource (TC-DER) Microgrids.

Named **Highland Park BRITE** (**B**eing **R**esilient **I**n **T**emporary **E**mergencies), the proposed project presents a unique opportunity to develop an advanced community microgrid that leverages the Borough's tight cluster of critical facilities to provide comprehensive benefits within walking distance of most our town's residents. In addition, this architecture minimizes the scale of distribution systems required to construct the microgrid, and there are significant assets already in place as a project foundation – enhancing the technical and economic feasibility of the project.

Highland Park has demonstrated progressive leadership in advanced energy projects, and is committed to the success of the **HP-BRITE** initiative. The Borough has engaged Gabel Associates (in conjunction with Burns Engineering) to lead the feasibility study. These two firms have the specialized expertise and experience needed to make this project successful, along with the support of key project partners that have provided letters of support. The local utility, PSE&G, has also agreed to participate in the study.

As a result of multiple failures of the public grid, Highland Park's 14,000 residents and over 3,000 buildings were without power for most of the month of November 2012. The implementation of the proposed microgrid would help reduce those vulnerabilities in the future, and allow Highland Park to provide the essential services needed by the Borough's residents during an extended outage.

We appreciate the opportunity to provide this application to the BPU. Please feel free to contact me at 732 296-0770 (mark@gabelassociates.com) if you have any questions. You

417 Denison Street, Highland Park, New Jersey 08904
Phone (732) 296-0770 Fax (732) 296-0799
www.gabelassociates.com

may also reach the borough directly at the office of the Mayor, Gayle Britt Mittler, 732-336-0030 (brillmittlerhp@gmail.com).

Sincerely,

Mark

Mark Warner
Vice President

HIGHLAND PARK
NJ NEW JERSEY'S FIRST GREEN COMMUNITY

HIGHLAND PARK - BRITE:

BEING RESILIENT IN TEMPORARY EMERGENCIES

A PROPOSAL TO THE NEW JERSEY
BPU TC-DER MICROGRID
FEASIBILITY STUDY SOLICITATION

SUBMITTED BY:
THE BOROUGH OF HIGHLAND PARK

MARCH 25, 2017

Mark Warner
Vice-President
Gabel Associates, Inc.
Phone: 732-296-0770
mark@gabelassociates.com

Gayle Brill Mittler
Mayor
Borough Of Highland Park
Phone: 732-572-3400
brillmittlerhp@gmail.com

1. Project Name and Introduction

This proposal is submitted by the Borough of Highland Park, New Jersey, in response to the Board of Public Utilities' solicitation for proposals to study the feasibility of Town Center Distributed Energy Resource (TC-DER) Microgrids. This proposal is for a detailed feasibility assessment for a microgrid project named **Highland Park - BRITE: Being Resilient In Temporary Emergencies.**

Highland Park (the "Borough") is in one of the nine designated Sandy impacted counties, and suffered extensive energy disruptions during that storm. The borough experienced extended outages of public electricity service and interruptions in all critical functions that depend on electricity. Power was not restored to many residents, and critical municipal infrastructure, until nearly two weeks after the storm. Shortly after power was restored due to the Sandy disruption, a local substation fire brought down power to most of the town for an additional 10 days. Due to these back-to-back events, this community of approximately 14,000 residents and over 3,000 buildings was without power for most of the month of November 2012.

In response to these events, Borough leadership has aggressively pursued a variety of strategies for improving resiliency of critical infrastructure that can better support the community during extended events where the public grid may be unavailable. The Borough has a variety of unique conditions that make it an ideal microgrid application, including convenient clustering of municipal infrastructure in very close proximity, municipal infrastructure embedded within a predominantly residential area within walking distance from these assets, and existing distributed energy resources that can be used as a basis for an advanced microgrid application. This opportunity was specifically explored in a preliminary study by the Rutgers Center Green Building in July 2015 (that study is provided as a companion document to this proposal).

The proposed HP-BRITE Feasibility Study builds on that preliminary study, with the goal of developing a more detailed project definition covering technical design, operational function, costs, benefits, and implementation details. The proposed Feasibility Study will allow for a well-informed go/no-go decision regarding the continued development of the HP-BRITE microgrid, and subsequent detailed technical design as envisioned by the BPU's TC-DER study process.

The Borough has engaged Gabel Associates ("Gabel") as lead consultant for the feasibility study, who has prepared this proposal on behalf and with the active participation of the Borough. Gabel is partnering with Burns Engineering ("Burns") to provide technical support for the study. This project benefits from unique infrastructural conditions, the support of the utility (PSE&G), active engagement by Borough leadership (especially the Mayor), and the skills of a project team uniquely qualified to complete the proposed Feasibility Study effectively. The project team brings an exceptional level of commitment, expertise, and experience in microgrid development, and the proposed Feasibility Study satisfies all eligibility requirements identified in the BPU's TC-DER Microgrid Feasibility Study application.

Executive Summary

This proposal is submitted by the Borough of Highland Park, New Jersey, in response to the Board of Public Utilities' solicitation for proposals to study the feasibility of Town Center Distributed Energy Resource (TC-DER) Microgrids. This proposal is for a detailed feasibility assessment for a microgrid project named **Highland Park - BRITE: Being Resilient In Temporary Emergencies.**

Highland Park (the "Borough") is in one of the nine designated Sandy impacted counties, and suffered extensive energy disruptions during that storm. The borough experienced extended outages of public electricity service and interruptions in all critical functions that depend on electricity. Power was not restored to many residents, and critical municipal infrastructure, until nearly two weeks after the storm. Shortly after power was restored due to the Sandy disruption, a local substation fire brought down power to most of the town for an additional 10 days. Due to these back-to-back events, this community of approximately 14,000 residents and over 3,000 buildings was without power for most of the month of November 2012. The HP-BRITE project will reduce the Borough's vulnerabilities to these disruptions, and allow a higher level of emergency support during outages of the public grid that would otherwise not be possible.

The proposed Feasibility Study will allow for a well-informed go/no-go decision regarding continued development of the HP-BRITE microgrid, leading to subsequent detailed technical design as envisioned by the BPU's TC-DER study process. The proposed microgrid consists of essential municipal services (Borough Hall, Police and Fire stations, schools and community centers serving as shelters and supply depots, and several senior and disabled housing facilities) that are conveniently clustered within three contiguous city blocks. This minimizes the scale of distribution assets required to construct the microgrid, and makes the development of the system more feasible from a scope and cost perspective. Several key generation assets are already in place to provide a starting point for microgrid development, namely several solar PV generation systems and multiple dispatchable back-up generators.

The Study Team will be led by Gabel Associates, Inc., which has been engaged by Highland Park as the lead consultant for the TC-DER Microgrid Feasibility Study. Gabel Associates will provide energy analysis, regulatory expertise, overall microgrid architecture planning, financial and economic analysis, project management, and reporting, and direct client support. Burns Engineering is partnering with Gabel Associates as a sub-contractor to provide technical support and project engineering.

The proposed microgrid project meets a critical need for the Borough to deliver strong emergency support services during a grid outage, and provides a variety of significant benefits to the Borough, its residents, and the state. The proposed project is also uniquely feasible, and of especially high impact on its community. Key advantages of this project include:

- Highland Park is a classic New Jersey mature suburb, with critical facilities that are concentrated in a tight cluster spanning only three city blocks. This rare degree of proximity makes the proposed project more feasible than usual due to minimized distribution asset requirements.

- Highland Park is considered a "walking town" and the critical support services enabled by the proposed microgrid will be within convenient walking distance for many residents (less than a half mile for most).This high degree of accessibility inherently maximizes the impact of the project on the local community.

- There are already existing renewable and dispatchable generation assets to build upon, which provides a substantial "head start" for the proposed project, including a reduction in the amount of project investment needed.

- The project is backed by highly committed and proactive leadership at the municipality with a proven record of success, including its designation as the first Green community in New Jersey, the development of several renewable and energy efficiency projects, and Sustainable Jersey certification. Borough leadership has been planning this project for several years, and is committed to following through on the implementation.

- An unmatched project team that brings specialized expertise around cutting-edge microgrid development. This team combines "best-in-class" commercial market and financial capabilities and one of a kind engineering expertise. Gabel Associates has been engaged as lead consultant, and brings in-depth knowledge of PJM, wholesale and retail energy markets, commercial regulatory and tariff issues, and project development activities. Burns Engineering is partnering with Gabel as a technical sub-contractor, bringing unmatched experience developing microgrids, including work with the Philadelphia Navy Yard and NJ Transit. The firms will capitalize on their complementary, on-the-ground experience to provide an in-depth assessment of technical, regulatory, and financial feasibility factors.

- The proposed project is proposed at a highly competitive fee and represents a showcase application that would demonstrate key microgrid benefits, and pioneer concepts and strategies that can be replicated to other projects.

The project meets the criteria identified in the NJIT Report, regarding the number of necessary FEMA Category III or IV facilities, and the total electric and thermal load intensity. The project meets all other requirements specified in the NJ application, including appropriate SBC use. **This proposal addresses all items listed in the "Program Technical Requirements" section of the application document,** including two additional sections (Project Overview and Feasibility Study: Work Program and Study Results). This proposal achieves the benefits sought by the BPU and can achieve enhanced resiliency to a municipality with a proven track record of progressive sustainability leadership, supported by a strong team of community project partners.

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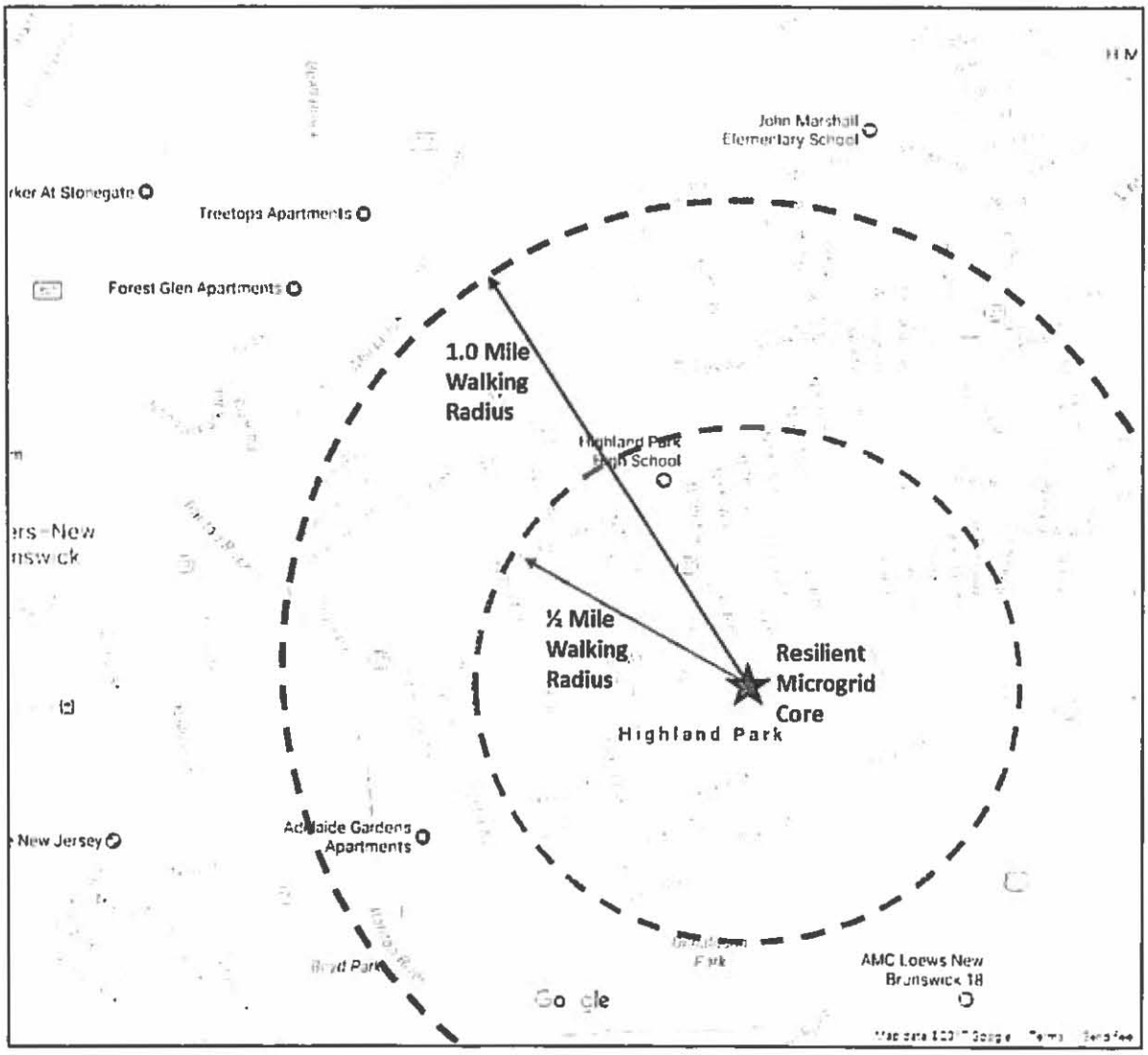
2. Project Overview

Highland Park is a compact, predominantly residential community in Middlesex County, New Jersey. The Borough is the third-densest town based on population, and the second-densest town based on housing, in the county. HP-BRITE proposes the creation of a small but highly impactful core of critical municipal infrastructure in a Class Three Community Microgrid configuration. This "island of resiliency" will be able to operate virtually indefinitely during an extended outage of the public grid, providing critical services to residential areas within convenient walking distance. The fact that Highland Park is a walking community, and within convenient access of the proposed microgrid facilities, makes this project uniquely impactful.

The following diagram shows the reach of the proposed microgrid anchor, and the full coverage it provides for the Highland Park community.



The proposed microgrid will ensure full functionality for Borough Hall, key first responder facilities (police and fire), schools, and other municipal centers that can serve a wide variety of shelter and emergency management functions, and nearby housing for senior and disabled citizens that must shelter in place. A core cluster of these facilities are located within three city blocks, and will be powered from back-up generators and upgraded solar generation capacity already in place, as well as additional renewable and dispatchable generation, energy storage, controls, and a specialized local distribution system. Additional high-value facilities are within 2,000 feet of this central core, and will be considered for inclusion in the microgrid as part of the study. Many of these assets will provide value under "Blue Sky" conditions, which provides a framework for financing the investment required for the project, but may then be called upon as part of the microgrid during an outage event.

The Highland Park area was identified as a potential high priority microgrid project in the New Jersey Institute of Technology (NJIT) study, and the specific facility configuration being proposed has been confirmed to meet the screening criteria used in the NJIT study.

Highland Park benefits from a unique combination of factors that make it an ideal class three community microgrid application. The Borough has exceptional characteristics that make the proposed microgrid **highly feasible**, and **highly impactful** on the community it serves:

- Highland Park is a very compact municipality: the majority of residents are within a 5-minute/half-mile walk of the resilient infrastructure proposed for development. Highland Park is unique in that these **core municipal services are centrally embedded in a predominantly residential area** with an **unusually high degree of accessibility**.
- The heart of the microgrid will consist of essential municipal services (Borough Hall, Police and Fire stations, schools and community centers serving as shelters and supply depots, and several senior and disabled housing facilities) that are conveniently **clustered within three contiguous city blocks**. This minimizes the scale of distribution assets required to construct the microgrid, and makes the development of the system much more feasible due to manageable scope.
- Several key assets are already in place to provide a starting point for microgrid development, especially the existence of several solar PV generation systems and dispatchable back-up generators. These assets are currently implemented to support individual buildings, and as such are "stranded" in their ability to provide back-up power for other nearby buildings. The microgrid configuration being proposed will **leverage these existing but under-utilized assets to provide resilient operations for the entire municipal cluster**. In short, Highland Park already has many of the assets needed to create the proposed resiliency solution, making the project much more feasible, especially from a financing perspective, than is typically the case.
- The proposed microgrid project has been under development and discussion for several years, so there is a **solid planning foundation in place, and strong community leadership support, for pursuing the project**. Highland Park has demonstrated its commitment to

advanced energy solutions in a variety of past projects, and has a proven track record of taking innovative concepts through to completion.

- The project team has developed several novel concepts that will make this project feasible from a business model and regulatory perspective, including solutions that depend upon the public utility acting as an active partner in the solution development and realization. Despite its compact physical size, the HP-BRITE microgrid will test and **demonstrate a fully functioning, Class Three, Community microgrid, with exceptional emergency management benefits to the surrounding community**. The elements of this advanced "proof of concept" will be replicable and scalable for larger more complex projects elsewhere.
- Beyond the success factors inherent in the project itself, **the project team is uniquely qualified to make this project successful**. This project will benefit from engaged and committed Borough leadership, supportive community partners, and the support of two of the most knowledgeable consulting firms involved in energy project and microgrid development in New Jersey (Gabel Associates and Burns Engineering).

All the necessary success factors are in place to make this a highly feasible, highly impactful Class Three microgrid project, which in addition to the direct resiliency benefits provided to the residents of Highland Park, will prove advanced concepts and provide learning that can be applied to other projects. This project therefore aligns strongly with the goals established for the BPU's TC-DER Microgrid Feasibility study project, addresses energy resiliency goals established by the state after Super-storm Sandy, and supports objectives in the State's Energy Master Plan.

3. Detailed Project Description

The Study Team, working with the Borough and other Project Partners, has identified a core microgrid project that is both highly feasible and highly impactful, and which capitalizes on the clustering of key facilities in a small contiguous block. This core configuration is the primary basis of this proposal. The team has also identified a variety of secondary sites that could be incorporated to significantly expand the project. The potential for including those secondary sites will be more fully covered as part of the proposed study.

Core Microgrid Project:

The core project is based on the following set of primary sites, which are critical to emergency support for the community, and which are conveniently clustered next to each other within three adjacent city blocks.

- **Borough Hall (221 S. 5th Avenue):** the center for municipal functions, and a key command and control facility during an emergency. This building provides a place for leadership and emergency support staff to meet, and serves as a central point for disseminating information to the community.

- **Police Department Headquarter (222 S. 5th Avenue):** the central headquarters for all first responder activities during an emergency period.
- **Fire Station (220 S. 5th Avenue):** critical first responder support during an emergency, tightly integrated with the nearby Police Department headquarters.
- **Senior Center (220 S. 6th Avenue):** a recreational facility that is a known gathering location for the community, and has "event space" and meeting rooms that can be used for a variety of purposes during an emergency, as well as a computer lab. Key functions during an outage include: a) warming location, b) cell phone charging, c) information source for residents, d) internet access, e) supply distribution point (water, etc.), and f) basic shelter in extreme events. This building is also known as "The Recreational Center".
- **Housing Authority (242 S. 6th Avenue):** A municipal entity that provides housing for 112 full time senior and disabled residents that meet low-income requirements. These residents must shelter in place, and are highly dependent on an electric elevator to service the multi-story building.
- **AHEPA Senior Housing (239 S. 6th Avenue):** A housing facility for 67 low income seniors that must shelter in place. These residents must shelter in place, and are highly dependent on an electric elevator to service the multi-story building.
- **Bartle School, and Board of Education (BOE) District Offices (435 Mansfield Street):** a local elementary school that can provide key support functions during an emergency, including: a) warming location, b) cell phone charging, c) supply distribution point, and d) basic shelter in extreme events. The BOE offices are integrated in the same building, and continued operation during an emergency is critical to make decisions and coordinate overall school district response.

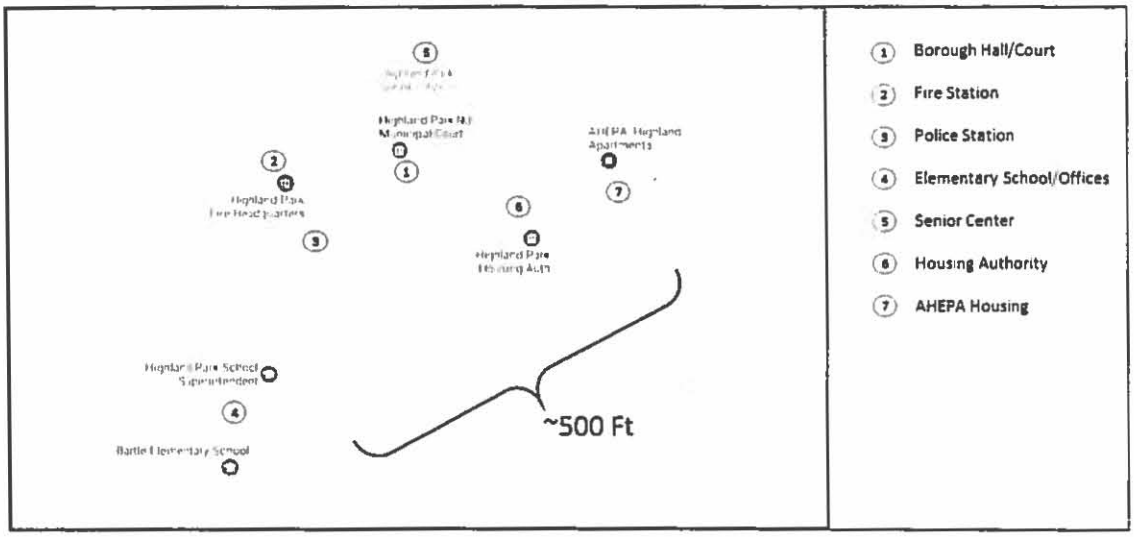
The Borough anticipates that it will be able to expand and strengthen its existing Emergency Management Plan based on the new capabilities enabled by the HP-BRITE project.

Key energy information, and FEMA classification, is summarized in the table below. The overall core microgrid project is approximately 1,349 MWHrs annually, and 59,248 Therms annually (10.5 billion BTUs total). Maximum electric load for all buildings combined is approximately 310 KW, supporting 239,284 heated sq-ft. Electricity consumption shown is net of any on-site solar. Heating is all piped utility-supplied natural gas.

Primary Sites	Address	FEMA	Heated Sq-Ft	kwhr	Therms	Total BTUs	BTUs/Sq-Ft
Borough Hall	221 S. 5th Ave	IV	7,750	157,261	5,752.865	1,111,883,049	143,469
Police Station	222 S. 5th Ave	IV	5,120	220,177	7,529.687	1,127,759,099	220,265
Fire Station (main bldg only)	220 S. 5th Ave	IV	5,170	25,500		463,493,920	89,651
Elementary School (Bartles)	435 Mansfield	III	94,325	537,943	5,304.560	2,365,992,828	25,083
Senior Center	220 S. 6th Ave	IV	7,450	65,280	3,380.251	560,769,599	75,271
Housing Authority	242 S. 6th Ave	III	70,512	204,270	15,260.917	2,223,089,538	31,528
AHEPA Housing (common area)	239 S. 6th Ave	III	48,957	139,040	22,019.290	2,676,352,946	54,667
Primary Site Total:			239,284	1,349,471	59,248	10,529,340,978	

These core microgrid locations are shown on the map below, and are in tight proximity within three adjacent city blocks. The extent of distribution asset needed to join these facilities into a

microgrid backbone is therefore relatively small. The overall physical size of the area within which the facilities exist is three blocks, in an area approximately 500X500 ft.



See the Technology Section (Section 6 below) for descriptions of key DER assets associated with the project.

During normal operations, all these sites will be connected to the public electricity grid (and, in most cases, piped natural gas) and will operate as usual. Existing and new solar PV assets will be installed at some locations, operating (during normal operation) in traditional net metering mode. Potential new assets (storage, additional solar or dispatchable generation) may also function to provide energy services during normal operation (see Financing in Section 7 below). During an outage of the public grid, all primary facilities will disconnect from the public grid and connect to the microgrid backbone. All DER assets, including existing and new solar generation, existing and new dispatchable generation, and energy storage, will also connect dynamically to the microgrid backbone to support resilient operation. Full building operation is planned for all primary sites (not just critical loads), in which case the automatic transfer switch transfers each building between "public grid" and "microgrid" backbones.

When operating in backup mode, the microgrid controller will balance loads with solar generation (when naturally available) and storage and dispatchable generation as needed in real time. The microgrid will coordinate with the public grid for "islanding" and "reconnection" transactions. When the emergency event is over and the public grid function is restored, all primary sites will reconnect to the public grid and resume normal operation.

Potential Additjonal Sites:

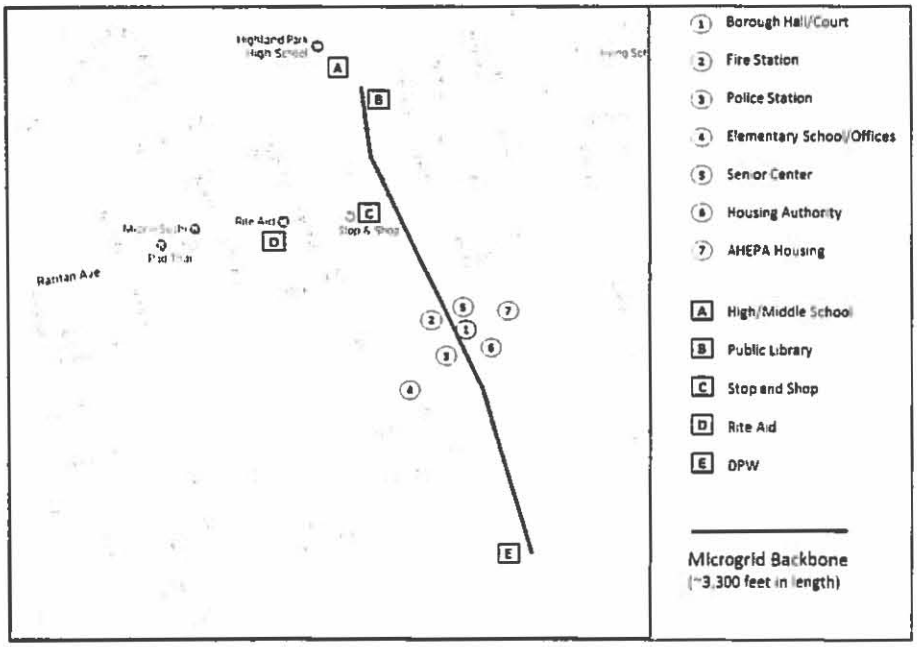
In addition to the primary sites identified above, several other "secondary" sites have also been identified, but are not yet fully assessed. These sites could significantly expand emergency support functions, and while their inclusion will require a larger microgrid backbone, it is still just

over half a mile in scale. Additional generation facilities (especially solar, and potentially combined heat and power (CHP)) are under consideration for inclusion in the project, and if deemed feasible, will make the addition of these sites viable (from an energy and power balance perspective). Secondary sites include:

- **The Stop and Shop grocery store:** continued operation of this location has a large impact on the community during an emergency event. The store currently has limited back-up power, insufficient to support refrigeration and other operations as is needed for extended outages.
- **Rite Aid pharmacy:** another key supply resource for the community during an extended emergency.
- **The High School and Middle School:** a significant physical asset that can expand warming and charging and distribution functions, and provide services closer to other north-side residents. This facility is approximately 1/3 mile to the core microgrid cluster, and essentially doubles the amount of emergency support space enabled by the microgrid.
- **The Public Library:** near the high/middle school, and is able to provide computer access to residents during an emergency, in addition to basic warming/charging support.
- **The Department of Public Works (DPW):** includes a garage for key municipal vehicles, and control center for dispatch and coordination.

These sites will be actively considered as part of the study, as the feasibility assessment merits. A wide variety of "third tier" sites, including commercial locations, houses of worship, and other public buildings have been identified and may also be further considered.

The following diagram shows the principal sites and potential secondary sites if included. The distance from the High School to the DPW is ~3,300 feet down S. 5th Avenue.



The Feasibility Study will also consider the installation of public DC Fast Chargers (DCFC), connected to the microgrid, to "fuel" electric vehicles during an outage scenario. These DCFC facilities offer substantial public benefit during normal operation, and allow electric vehicle owners to remain mobile during emergency conditions. The Study Team has unique expertise in developing DCFC facilities, which will increase the benefit and market development impact of the proposed effort.

Related Energy Projects

The BPU application indicated that any previous energy projects completed by the applicant, especially for energy efficiency, be identified. Highland Park is an extremely progressive municipality when it comes to sustainable energy, and it has been at the forefront of implementing advanced projects whenever feasible. Both town-wide energy reduction programs, and energy efficiency measures for borough buildings (through the Direct Install program offered as part of the New Jersey Clean Energy Program) have been implemented. Both of these projects were submitted to Sustainable Jersey as part of the Borough's Silver certification, and are described in more detail below:

- **Home Performance with Energy Star Municipal Program:** With the support of a Climate Showcase Communities grant from the U.S. Environmental Protection Agency (EPA), the Borough of Highland Park was able to develop and staff an effort to encourage residents to get a home energy audit and take advantage of the incentives provided by the Home Performance with Energy Star program. As part of this effort, the Borough issued an Request for Proposals (RFP) to select a certified contractor to perform high-quality audits at a fixed price for Highland Park residents. A letter was then sent to more than 2,500 households announcing the home energy assessment program. The program was also promoted on a billboard as well as in multiple community newsletters. On May 24, 2012, a workshop was held for residents that reviewed all of the home improvement programs available through the Borough, including the home energy assessment program. The workshop was captured on video and can be seen on YouTube at the following link: http://www.youtube.com/watch?v=JrSwsg4EAtA.

- **Direct Install for Borough Buildings:** Highland Park has enrolled all its municipal buildings in the Direct Install program: municipal building/borough hall, senior center, fire/police, public works, and the library. Scope of work, performed by Tri-State Light and Energy in 2011, included lighting upgrades, high efficiency AC on selected buildings, occupancy sensors, programmable thermostats, and electronic economizers.

- **Net Metered Solar PV:** Borough Hall and the Fire Station both contain net metered solar PV projects of 6 KWdc and 28 KWdc, respectively.

Highland Park has earned its reputation at the "First Green Community in NJ", and has implemented a wide variety of sustainability projects over a multi-year period. Most recently, the Borough passed a resolution to buy only Energy Star appliances to reduce energy use, begin the process of certification for its schools in the Sustainable Jersey for Schools program, and re-purposing of a municipally controlled landfill to host a large solar installation. The Borough has been recognized for its distinguished leadership in sustainability, including a 2003 Innovation in Governance award from the NJ League of Municipalities, the 2005 Environmental Leadership Award from the NJ DEP, and being the 2005 Clean Energy Municipality of the Year as awarded by the NJ Office of Clean Energy. Many businesses in the community share this commitment to sustainable energy – for example, the Orchard Garden (a private apartment complex) recently implemented an upgraded to more efficient HVAC equipment. These results demonstrate both a strong and enduring commitment to advanced sustainable energy solutions, and a proven ability to execute on complex projects. This track record is a strong success factor for the proposed HP-BRITE project.

4. Screening Criteria Compliance

The proposed project is fully compliant with screening criteria specified in the application, and builds on energy projects completed previously, especially regarding energy efficiency.

Screening Criteria Compliance

Highland Park was identified in the NJIT "Microgrid Study"[1], and Highland Park is located in Middlesex County which is one of the nine "Sandy designated counties". For completeness, however, the NJIT screening criteria were applied to the core HP-BRITE configuration. These criteria were identified in the NJIT study, and the BPU TC-DER Microgrid Feasibility Study Application:

- **Criteria One:** include at least two category III or IV facilities within 0.5 miles:
  - The Police Station is a FEMA Category IV facility
  - The Fire Station is a FEMA Category IV facility
  - These buildings are next door to each other, and within the 0.5 mile requirement
  - Other critical facilities participating in the project, especially the school, the Senior Center, and both senior/disabled residential centers, are essential for the delivery of vital services during an extreme outage, and function as a Class III facility. Note that the AHEPA senior housing and the Housing Authority (senior/disabled) serve residents that predominantly shelter in place, and are multi-story facilities that depend heavily on electric elevator service. All these facilities are within several hundred feet of each other, on adjoining properties.

[1] "New Jersey Town Centers Distributed Energy Resource Microgrids Potential: Statewide Geographic Information Systems Analysis", Technical Report, New Jersey Institute Of Technology, October 2014.

- **Criteria Two**: at least one building with energy usage intensity of approximately ~90,000 BTUs/sq-ft:
  - The Borough Hall exceeds the energy intensity requirement of 90,000 BTUs/sq-ft. As noted in the table in Section 3 above, annual energy usage (of both electricity and natural gas) is ~1.1 billion BTUs, for a building of approximately 7,750 heated square-ft, which is 143,469 BTUs/sq-ft.
  - The Police Station exceeds the energy intensity requirement of approximately 90,000 BTUs/sq-ft. As noted in the table in Section 3 above, the annual energy usage (of both electricity and natural gas) is ~1.1 billion BTUs, for a building of approximately 5,120 sq-ft, which is 220,265 BTUs/sq-ft.

The core set of critical facilities proposed for HP-BRITE fully meet both of these criteria which were specified in the BPU application guidelines.

5. Project Partners

The Mayor of the Borough has aggressively pursued the planning and organization of the proposed project over a several year period. As a result, the project is well supported by a strong set of project partners that have agreed to participate in the proposed feasibility study, including:

1. **Municipal Facilities**: Key critical facilities included in the project are under direct municipal control, and their support is inherent in the proposal being made by the Borough. These buildings include Borough Hall, the Police Station, the Fire Station and the Senior Center (AKA Recreational Center).
2. **K-12 Schools:** The Board of Education is participating in the project, and has provided a letter of support from the Superintendent of Highland Park Public Schools. Note that both the Bartle Elementary School and the central offices for the district, are located in the same building and are part of the microgrid core project.
3. **Highland Park Housing Authority:** This senior/disabled housing facility is part of the core project, and has provided a letter of support from the housing director.
4. **AHEPA Senior Housing:** This low income senior facility is part of the core project, and has provided a letter of support from the property manager.
5. **The Local Utility:** PSE&G is the local utility for the Borough, and provides electricity and natural gas for all facilities participating in the project. The utility has been briefed at a high level on the project, and has provided a letter of support to participate in the study.
6. **Project Consultants:** The Borough has engaged Gabel Associates as the lead consultant for the project. Offices for Gabel Associates are physically located in Highland Park, and principals of the firm have a long-standing relationship with the Borough and its residents. The firm is therefore ideally suited for this particular project, in addition to their relevant and specialized subject matter expertise and extensive experience. Gabel Associates has partnered with Burns Engineering to provide technical and engineering support for the project, building on their unique experience and track record with microgrid

development. The fully adopted board resolution adopting Gabel for the project is provided along with the other Letters of Support discussed above.

Please see **Appendix A** for copies of the Letters of Support noted above, and the authorizing resolution for consulting services being provided by Gabel Associates for the project.

The most critical element in a project of this type is active support by the project partners, and the proposed project benefits from an exceptionally high level of well aligned support. The Mayor's office has provided leadership on developing the project over a multi-year period, and has the support of the Borough council, the school district, the utility, management of critical senior and disabled housing facilities, and two consulting firms with both local presence and unmatched experience and expertise. Procurement of the needed consultants to support the project has already been completed, including authorization to implement the proposed study if awarded.

6. Technology Description

Sections 2 and 3 summarized the project overall. The key technologies and operation of the proposed solution is outlined below.

Existing Assets: There are a variety of existing assets already in place that will be re-purposed for use within the new microgrid configuration:

- Borough Hall – net metered solar PV on the roof, 6 KWdc
- Fire Station – net metered solar PV, on a parking lot shade structure, 28 KWdc
- Backup Generator – currently at the Fire Station, 150 KWac (diesel)
- Backup Generator – currently at the Senior Center, 125 KWac (piped natural gas)

All four of these assets will be re-configured for use in the core microgrid solution, potentially including (pending further analysis): a) islanding capability for both solar PV systems, b) energy storage (in support of islanding function), and (c) additional backup generator controls.

New Assets: proposed new infrastructure for the core installation, pending further analysis as part of the study, is as follows:

- **New solar PV:** facilities at the Fire Station (roof), Housing Authority (roof), and the Senior Center (roof). Other facilities are also under consideration for additional net metered solar. If implemented, all of these renewable generation assets would be integrated as part of the microgrid.
- **Additional dispatchable generation:** the existing back-up generation, plus existing and planned solar generation, are approximately sufficient to support the core building set from a power perspective. To firm the intermittent supply of solar, and ensure sufficient energy needs are met (in addition to power), and to provide control flexibility for the microgrid, a modest amount of dispatchable generation will probably be installed as part

of the microgrid. The exact size of this asset, and its optimal type and location, will be determined as part of the feasibility discussions, and is dependent on finalizing details on the new solar assets being considered.

- **New distribution assets:** it is likely that new conductors will be installed within the three-block contiguous cluster of properties that will support all the core buildings, estimated at less than 2,000 feet total length. This distribution system will probably be dedicated to microgrid use, and most of this length is on Borough property.
- **Energy storage:** electricity storage technology will be installed, potentially as a common asset for the entire microgrid, as determined to be required to enable flexible island operation. This fast response storage asset will help balance power and energy needs between the buildings and various DERs: multiple solar PV (existing and new) and multiple dispatchable generation (existing and new).
- **New switchgear:** components as needed to interconnect the buildings with the microgrid, especially automatic transfer switches to connect buildings to either the public grid (for normal operation) or the microgrid (for backup power operation).
- **Sensors and Controls:** sensing equipment and a central microgrid controller. Communications will be provided to control systems at PSE&G as required.

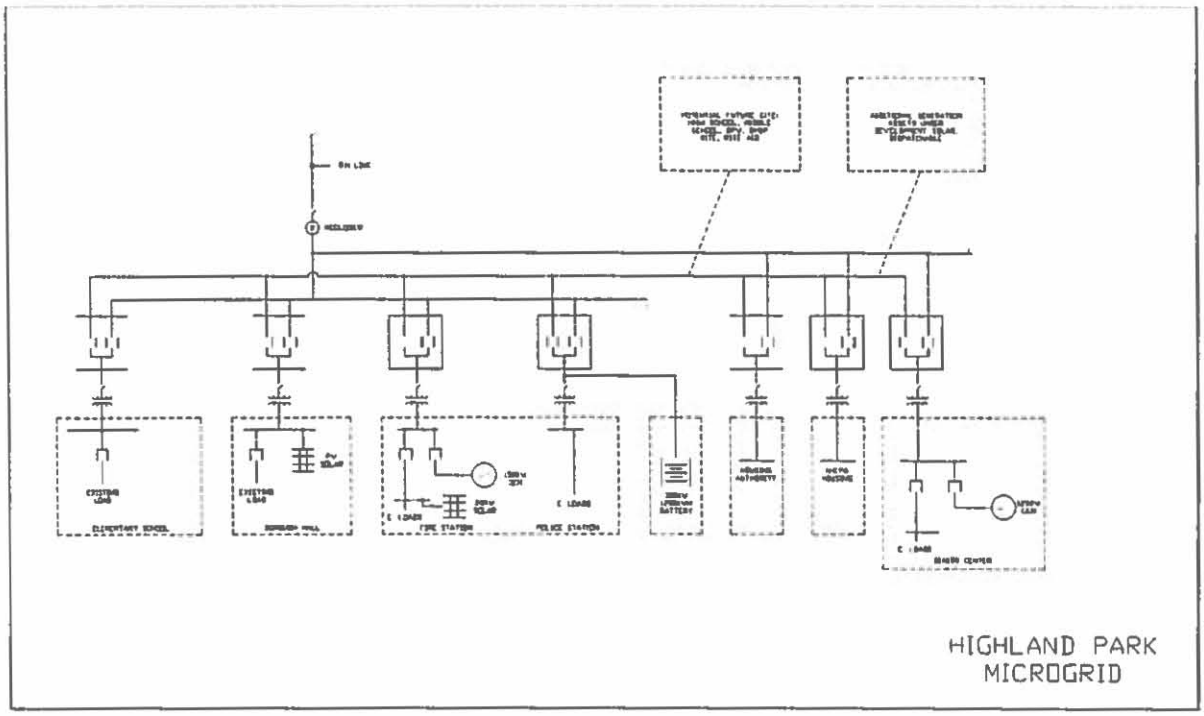
Actual component selection and sizing will be completed as part of the Feasibility Study.

Secondary Sites: As noted in Section 2 and 3, a set of secondary sites have been identified that may also be included in the final project design depending on a variety of feasibility factors still under consideration. These additional sites (high school, middle school, Department of Public Works, Stop and Shop store, Rite Aid pharmacy, and Public Library), if included, would also need interconnection and control equipment as outlined above. Large ground-based solar facilities are also under development near the microgrid cluster, which could potentially provide a significant additional source of power and energy. The primary additional assets needed for this expanded project is additional distribution assets running along the "South Fifth Avenue" right of way between the high/middle school (at the intersection of 5th Avenue and Montgomery Street), and the DPW (at the intersection of 5th Avenue and Valentine Street). This microgrid backbone along 5th Avenue is approximately 3,300 feet in length. Small branch feeders will be provided off this main microgrid backbone to reach the Stop and Shop, Rite Aid (within two contiguous blocks), and the Public Library.

As noted, significant additional large scale solar PV projects are in mature stages of development very near the proposed microgrid backbone. These generation assets, if included, will significantly expand the generation capability of the microgrid, and allow it to operate virtually indefinitely with minimal fuel dependence. Integrating these additional assets, already under development, will be a primary goal for the Feasibility Study.

Based on high level discussions with PSE&G, the existing utility distribution systems are identified as "non-radial". More specific determination of these factors will be undertaken as part of the Feasibility Study.

The following conceptual one-line diagram illustrates the microgrid configuration being considered in the proposed Feasibility Study.



The connections of the critical facilities and the DER technologies, as well as the location of the electrical connections to PSE&G's facilities and equipment (and the type of the system the microgrid would be connecting into) will be defined as part of the Feasibility Study. Such details can only be determined in close cooperation with the utility, which can be addressed with PSE&G's support and cooperation during the Feasibility Study.

7. Overall Project Cost and Potential Financing

As noted in Section 6 above, key assets for the microgrid project are already in place, and will be re-purposed for use in the microgrid solution. This approach helps reduce the cost of the microgrid solution. Key new assets – especially new solar – will be funded separately as economically independent entities, delivering value under "blue sky" conditions.

Additional investments, specific to the microgrid itself (for the core project) are as follows:

1. Distribution system backbone (within three contiguous blocks)
2. Automatic Transfer Switches (ATS), and related protection, distribution, or switching equipment as need per location
3. Energy storage, estimated to be approximately 300KW/1200 kwhrs in size

4. Upgrades to existing (and new) solar to allow microgrid integration and islanding operation
5. At least one dispatchable genset, likely fueled through piped natural gas, probably 500KW in size or less; a small CHP or fuel cell application will be considered if suitable conditions are identified
6. Control system equipment (sensors, actuators, equipment integration), and a microgrid controller

Preliminary estimates for these new assets, for the core project only, is approximately $2M (equipment/material costs only), not including new solar, which will be financed separately.

Financing strategies for the required project investment will be a primary focus of the Feasibility Study. As noted above, key assets are being developed so as to ensure "blue sky" revenue streams to support project economics, especially solar assets that deliver economic value directly to hosting sites. The storage assets, and potentially any new generation assets, may be used to generate value through participation in ancillary markets, capacity markets, and/or demand cost reductions. The Study Team also intends to work with the public utility (PSE&G) to explore opportunities for joint financing of key assets, particularly the distribution backbone. The financing strategy will be based on designing a system that maximizes "blue sky" revenues through a portfolio of grid and host site services during normal operation, using assets that can then be engaged for resiliency support as part of the microgrid during a public grid outage.

As part of the Feasibility Study, the Study Team will also identify any funding sources or incentives that might be applicable for the project, including the any New Jersey Clean Energy Program Funds, the Energy Resilience Bank (if funds become available), and other sources.

8. Project Benefits

Highland Park currently has extremely limited energy resiliency for critical infrastructure. The Borough is committed to significantly expanding the level of support it provides to the community during grid outage events. As noted in Section 2 above, this project is both highly feasible and highly impactful, and represents an exceptional opportunity to dramatically improve the level of emergency support services provided to the community.

Most importantly, the core critical facilities (Borough Hall, Police Station, Fire Station, the Senior Center, and two nearby senior/disabled housing facilities, and the nearby school and BOE district offices) provide a kernel of emergency management function that serves the entire community. Most of the 14,000 residents of Highland Park live within walking distance of this core of expanded emergency support services the project will make possible.

Based on the initial design analysis, the proposed microgrid will be able to provide un-interrupted power to critical facilities for an indefinite period of time. The use of renewable generation

assets will reduce dependence on fuel supplies. Note that support will be provided for "full building" functionality at all critical facilities, not just "critical loads".

With the availability of expanded and more reliable power for critical facilities, the Borough will be able to significantly increase the level of support it provides to the community during an outage event, especially for events of longer duration. Key benefits **DURING AN OUTAGE** include:

1. **Emergency Management:** Assurance of back-up power for Police and Fire stations, which serve as the core for emergency management operations across the entire community.
2. **Community Coordination:** Assurance of back-up power for the Borough Hall, which also plays a central role in coordinating numerous support functions during an extended outage. This facility serves as a meeting place for community leadership and response coordinators, and a primary source of information for residents during an extended event.
3. **Warming Center/Distribution Points:** The Senior Center, also known as the "Recreational Center", has meeting space and is designated as a "warming center" for residents. It can also serve as a community gathering point, a charging point for cell phones, and a distribution point for supplies (water, etc.). The nearby Bartle School currently does not provide emergency support due to the lack of power, but as a result of the microgrid, it will also be able to provide warming/distribution/cell phone charging functions, and if needed in extreme cases, shelter functions.
4. **Senior and Disabled Housing:** Both the Highland Park Housing Authority and the nearby AHEPA housing facility contain nearly 200 full time senior, disabled, and low income residents. Most of these residents must shelter in place during an outage event, and these facilities today have limited ability to support their residents when the power is out. This is especially critical since these are multi-story facilities served by an electric elevator. Ensuring reliable power supply for these facilities ensures that the community's most vulnerable residents can be cared for and protected during an extreme event.

- **Impact on Surrounding Communities:** Creating an island of resiliency in Highland Park impacts more than just the immediate Borough population. Many Highland Park residents work in nearby New Brunswick, both at the Rutgers campus, and at nearby critical medical facilities (especially RWJ University Hospital and the Children's Specialized Hospital). Providing this dense residential area with more resilient energy infrastructure has a direct impact at critical nearby facilities where those residents work.

5. **Proof of Concept and Project Learning:** While this project is compact in physical size, it will be a fully functional Class Three community microgrid. This facility will serve as a proof of concept for a quintessential microgrid implementation, with working demonstration of key technical elements, regulatory concepts, and financial strategies. These advancements and learnings can then be scaled up and replicated for other more complex projects. Particular benefit will be realized through the combination of renewable and dispatchable generation assets in a microgrid configuration, which is a key strategic priority for New Jersey.

The residents of Highland Park will therefore have significantly stronger municipal support during an extended power outage, including better command and control, additional warming and cell phone charging capability, better supply distribution arrangements, potentially shelter and food supply facilities (if needed), and support for senior and disabled housing that must shelter in place. There is high need for the resiliency benefits that will be enabled by the HP-BRITE project, since the Borough has limited ability to provide many of the services and support functions described above. By combining these critical facilities into a "resiliency island", the microgrid meets a critical emergency management need in a highly cost effective way compared with other alternatives.

Key microgrid assets will also deliver benefits, and economic value, during normal operation. Key opportunities include host site utility bill reduction (through net metered solar), participation in ancillary, capacity markets, and other grid service markets (which can also provide additional revenue streams), , and potentially host site demand cost reductions. These benefits will be quantified as part of the Feasibility Study, and will be a key factor in project financing (see Section 7 above).

This microgrid project is highly feasible, and highly impactful in its ability to providing advanced emergency management services for thousands of local residents during a power emergency. Additional value, with economic benefits to support project financing, will be available during normal ("blue sky") operation. The relatively small physical size of the proposed project makes development of these advanced functions highly achievable, but its high level of functionality makes it an exceptional proof of concept and learning platform.

This proposed project is consistent with the use of the Societal Benefit Charge (SBC) as set forth in N.J.S.A. 48:3-60(a)(3) since all identified load sites pay regulated utility power bills and therefore contribute to the SBC fund.

9. Microgrid Communication Systems and Controls

Microgrid control can range from simple strategies and technologies such as "droop control" to more advanced systems that optimize microgrid assets and operations relative to the local distribution utility and energy markets. The extent to which the microgrid and the local utility interoperate in real time is an integral part of system evaluation and design, and can only be determined with active participation of PSE&G. These considerations will be a key part of the feasibility study being proposed.

Burns Engineering will serve as technical lead for determination of communication and control strategies, working with PSE&G and the rest of the project team. Burns is working with GE and Pacific Northwest National Lab (PNNL) to develop and test microgrid control technology based on a $1.3 million grant from the Department of Energy. The senior engineering staff at Burns is participating in IEEE's working group for the P2030.7 Standard for the Specification of Microgrid Controllers, and is tracking the broader 2030 Smart Grid Interoperability Series of Standards.

Burns will bring state-of-the-art understanding of microgrid controller interfaces, microgrid controllers on the market, and strategies for interoperating with the local distribution system.

Based on the outcome of the Town Center Microgrid feasibility study, the recommended functionality of the microgrid, and in collaboration with the local utility, the Gabel-Burns team will recommend a control technology and communication strategy best suited for providing that functionality.

10. Project Timeframe

The Feasibility Study is expected to take approximately nine months, and will include: a) data collection, b) modeling and design optimization, c) detailed microgrid definition, d) financial and implementation planning, and e) study results documentation phases. Gabel Associates will serve as lead consultant for the effort, and will provide all project management and reporting required.

11. Microgrid Modeling Approach

Burns Engineering was an early industry partner with Lawrence Berkeley National Lab (LBNL) to field test and refine the Lab's "Distributed Energy Resources Customer Adoption Model (DER-CAM)" to model and optimize microgrids. DER-CAM is a techno-economic model that optimizes the design, sizing and configuration of distributed energy resources based on market information (fuel prices), system load information (hourly end-use loads), and DER technology information (costs, performance data, etc.). DER-CAM outputs the optimal selection of technologies, e.g. PV, solar thermal or CHP that should be adopted and details how they should be operated based on the specified inputs. Another key output includes CO_2 emissions. The tool allows the microgrid designer to optimize economic savings and environmental benefits, specifically CO_2 emissions reductions.

Burns continues to work with LBNL and was recently awarded a Department of Energy grant to further collaborate with LBNL to test and refine a new version of DER-CAM focused on remote microgrids with a specific focus on military bases and forward deployments. In addition to DER-CAM, Burns is also experienced using HOMER (Hybrid Optimization Model for Multiple Energy Resources) to model and simulate distributed energy resources and microgrids. The Study Team will also use DER cost/benefit models developed by Rutgers, the specifics of which will be confirmed as part of the project award.

Given this base of experience, Burns will work with the project team to determine an optimal microgrid design. Focus will be on matching existing facility loads, as modified for outage usage scenarios, with existing and new generation assets. Particular focus will be on the combination of intermittent renewable energy sources and dispatchable generation assets to meet likely microgrid loading requirements. These results will help identify the additional generation assets required for the solution. This modeling will be a key part of the Feasibility Study.

Detailed modeling of the proposed microgrid solution has not yet been completed, since that requires in-depth involvement of the utility and much more detailed (potentially hourly) profiles of system operation. This more detailed modeling will be a primary focus of the Feasibility Study.

12. Requested Funding Amount

The cost of the HP-BRITE TC-DER Microgrid Feasibility Study is a fixed fee of $135,000, and that is the amount of the grant request being made to BPU. The Borough has already invested in the previous preliminary study, and in the project definition necessary for submitting this proposal.

13. Cost Share

The Borough, and the other project partners, will contribute cost share in the form of staff hours as required for the project.

14. Listing of Consultants / Project Study Team

In addition to the Project Partners outlined in Section 5, the Study Team will provide the subject matter expertise needed to complete the proposed feasibility study. Gabel Associates, Inc., has been engaged by Highland Park Borough as the lead consultant for the TC-DER Microgrid Feasibility Study, and will provide energy analysis, regulatory expertise, overall microgrid architecture planning, financial and economic analysis, project management, and reporting, and direct client support. Gabel Associates is partnering with Burns Engineering as a subcontractor to provide technical support and project engineering.

This is a uniquely qualified team for the Highland Park microgrid project: Gabel Associates is one of the most experienced energy consultants in the state, and has proven experience developing advanced energy projects of this type, especially those that require the careful integration of regulatory, technical, and economic factors. Burns Engineering is at the forefront of microgrid development, and is one of the few firms with real world experience building operating microgrid systems.

More information on each firm is provided below as an introduction. Please refer to detailed qualification packages provided as companion documents with this proposal.

Gabel Associates, Inc.

Gabel Associates, Inc. is an energy, environmental and public utility consulting firm with its principal office located in Highland Park, New Jersey. In business for over 23 years, the firm provides its expertise to a wide variety of clients. Our client list includes public agencies at the local, county, and State levels, individual commercial and industrial end users, aggregated groups of customers, public utility commissions, power plant owners and operators, wholesale suppliers

and utilities. We have successfully assisted public and private sector clients in implementing strategic energy plans to reduce costs, enhance environmental quality, and achieve results with cutting-edge advanced energy innovations.

Gabel Associates combines technical skills with in-depth, specialized financial and regulatory knowledge. The firm is deeply involved in regulatory, legislative and tariff issues throughout the country, which is a particularly important area of expertise for the proposed microgrid project.

Gabel Associates has been a leader in advanced clean energy projects since the earliest days of deregulation in New Jersey. The firm has supported clients implementing hundreds of net metered solar projects, energy efficiency projects, CHP, and advanced clean energy procurement engagements. CHP projects are considered a basic form of microgrid by the BPU, and Gabel Associates has unique and extensive experience developing such projects in New Jersey. Its deep understanding of RTO, regulatory and commercial development issues will allow the project to realize all available economic value and will enable a full understanding of project financial issues.

As Director of the Electric Division at the New Jersey Board of Public Utilities, Firm President, Steven Gabel, formulated policies leading to the development of over 1,200 MW of cogeneration capacity in New Jersey in the 1980s. Since then, the firm has used its expertise in energy economic, tariffs, and forecasting to assist dozens of clients through the CHP development process -- from initial feasibility studies and economic and financial analysis through implementation and project completion, to electric and thermal sales, facility optimization, and contract restructuring. The firm is uniquely qualified to combine technical, economic, and regulatory factors into the complex process associated with advanced microgrid development, and will be able to bring decades of related experience from similar CHP project development to the feasibility study.

Gabel Associates' cogeneration clients have included the State of New Jersey (for the Trenton Cogen District), PureEnergy, Montclair State University, the Department of Veterans Affairs, Revel Entertainment, PGE Generation, Trigen Energy, Schweitzer-Mauduit International, Cogen Technologies, Newark Bay Cogen, East Coast Power, Marcal/Prime Cogen, NJEA Cogen, Newark-Boxboard Cogen, Camden County, Essex County, Bayonne Cogen, Parlin Cogen, Milford Cogen, Lakewood Cogen, El Paso, Schering Plough, Con Ed Development, Garden State Paper Company, and the Wayne Township Board of Education. Some of the firm's most notable CHP projects are described in more detail below:

- **Department of Veterans Affairs**: Gabel Associates performed five (5) detailed CHP feasibility studies for VA medical centers in Florida, West Virginia, Tennessee, and Pennsylvania.

- **Montclair State University**: Gabel Associates provided consulting services to Montclair State University (Montclair) in Montclair, New Jersey regarding the development of its 4.3 MW Combined Heat and Cooling Power Plant (CHCP) facility at the site. Specifically, Gabel Associates supported the selection of an entity to develop the cogeneration facility,

including the construction of a new energy distribution system consisting of steam, condensate, and chilled water piping. The firm assisted with the following tasks: comprehensive financial, economic, and risk analysis; development of detailed specification preparation for the bid evaluation matrix; evaluation of key issues including plant structure, efficiency, capacity, operations and maintenance structure, and operational design; and Energy Services Agreement (ESA) negotiation.

- **Rutgers University**: Gabel Associates performed a financial feasibility assessment of proposed CHP projects at the Busch Campus and College Avenue Campus.

- **Revel Entertainment**: Gabel Associates prepared a detailed financial analysis of a proposed CHP project at the Revel Casino in Atlantic City, New Jersey. Our services also included a comprehensive analysis of the proposed energy services agreement. These analyses served as the basis for Revel's negotiation and development of an 11 MW project.

- **Harrisburg Authority**: Gabel Associates conducted a cogeneration and energy marketing study in an effort to make a recommendation as to the most financially beneficial use of energy created by the plant formerly known as the Harrisburg Resource Recovery Facility.

- **East Coast Power**: Gabel Associates provides consulting support to East Coast Power on issues related to its 940 MW natural gas-fired cogeneration unit located in Linden, New Jersey.

The firm was also engaged by the BPU's Office of Clean Energy to prepare a marketplace assessment associated with its CHP grant program, and to make recommendations on improvements to the program to provide for greater CHP project development. By gathering widespread data through surveys and interviews, we were able to assess the market penetration of this advanced technology. Through this assessment, Gabel Associates was able to identify fundamental flaws within the program, which allowed the State to improve the financing process and enhance CHP activities.

In addition, Gabel Associates has been a trailblazer on a range of complex energy issues in New Jersey, including development of the first solar project on a landfill, progressive policy advancement related to offshore wind, and comprehensive analysis around electric vehicle expansion.

Please refer to a detailed qualification package for Gabel Associates provided as companion document with this proposal.

Burns Engineering

Burns is a multi-disciplinary engineering firm organized by the industries it serves. Initially recognized as a premiere aviation systems engineering firm with over 50 years of experience in airport planning, design and construction services, the firm has grown to include Rail Transit,

Facilities & Infrastructure and Energy groups. Incorporated in the state of Pennsylvania in 1960, Burns is headquartered in Philadelphia, PA, with offices in seven other states including Denver, CO. Burns employees approximately 195 staff, including 165 professionals.

The Energy Group is at the forefront of a dramatic transformation in how electricity is produced, distributed and consumed, and is dedicated to helping customers improve power reliability, lower costs and reduce emissions. Burns' energy planning work for the City of Philadelphia's Navy Yard has gained global attention as a case study for how the energy infrastructure of the future can be designed to leverage advanced technology, dynamic energy markets, and private-public-partnerships that foster smart economic development, job growth and urban renewal. This project has helped revitalize the once abandoned Navy Yard into a "smart energy" campus. Other notable energy planning and infrastructure projects include assessing the feasibility of a microgrid to power rail transit operations between northern New Jersey and Manhattan. Based partly on Burns' preliminary design and feasibility study, New Jersey Transit obtained a $409 million grant from the Federal Transit Agency to finalize design and construct this project. Recently, Burns was awarded three community energy planning and microgrid feasibility projects for communities in New York.

Burns is also one of a few industry partners to Lawrence Berkeley Lab regarding the final development and application of "DER-CAM", LBL's energy infrastructure planning and microgrid modeling tool. Burns is one of a small number of engineering firms with real-world experience in microgrid planning, design, and construction, and will bring that expertise and track record to the HP-BRITE initiative.

Please refer to a detailed qualification package for Burns provided as companion document with this proposal.

15. EDC and GDC Letter of Support

PSE&G is the local utility for the Borough, and provides electricity and natural gas for all facilities participating in the project. The utility has been briefed at a high level on the project, and has provided a letter of support to participate in the study, which can be found in Appendix A.

16. Feasibility Study: Work Program and Study Results

The feasibility study will take the relatively mature HP-BRITE project definition to the next level of project planning, technical design, and financial planning detail. The study results will allow for a detailed go/no-go decision regarding continued project development, and will provide the information needed for subsequent technical design leading to full implementation.

Work Program

Key work elements in the proposed feasibility study include:

1. **Project Formation:** Working with all project partners to formalize project participation and organize the feasibility study effort.
2. **Baseline Data Collection:** Collecting additional energy usage and facility information as needed for more detailed design and operational modeling.
3. **Infrastructure Assessment With PSE&G:** Working with the utility to understand local infrastructure assets, current condition, and possible role during microgrid operation. Identify interoperability requirements between the microgrid and the utility.
4. **Detailed Load Characterization:** Based on more detailed baseline information collected, quantify load characteristics for all load sites, during normal operation, and during an outage scenario where additional support functions are being provided.
5. **Detailed Generation Asset Requirements:** Quantify existing generation assets and their operating profiles, and identify new generation assets already planned, or as potentially new assets, to support microgrid function.
6. **Microgrid Architecture Development:** Combine loading requirements, generation asset plans, existing infrastructure details, and requirements for new resiliency function to define an overall microgrid solution architecture. All key solution elements will be defined, their manner of connection, and basic operating profile defined.
7. **Design Optimization:** Based on the architecture defined by the Project Team, pursue detailed modeling on operation, sizing, and both costs and benefit trade-offs to identify an optimal solution configuration.
8. **Cost and Benefit Quantification:** Based on the optimized solution, quantify expected project costs and associated benefits.
9. **Financial Planning:** For new infrastructure required by the project, identify potential financing strategies that can be used to make the project viable. Many solution elements will provide value during "blue sky" conditions, which provides a basis for project financing.
10. **Identifying Next Steps:** Work with the multi-disciplinary project team to identify key "next steps" required for full project implementation.
11. **Results Documentation And Communication:** Development of documents and presentation materials for communication to all interested parties.
12. **Ongoing Project Management:** Direct support for the project partners, and overall project management of schedule, work plan, milestones, and resourcing as per typical practice.

Feasibility Considerations and Criteria

Leveraging experience with rigorous microgrid studies in other jurisdictions, the Study Team has identified a methodology for evaluating feasibility. This framework of considerations and criteria has been adapted from the NY PRIZE microgrid study project, as modified to be appropriate for this project. This framework will be used to **guide and inform** the Feasibility Study's technical analysis, focusing on three areas:

- Task One: Requirements Definition
- Task Two: Technical Design Sufficient For Evaluation
- Task Three: Feasibility Evaluation

Please see **Appendix B** for a detailed summary of these considerations and criteria.

Study Results

As a result of the work plan and study scope defined above, the Study Team will provide presentation materials and a final report summarizing results. Key sections will include:

1. Feasibility Study Background
2. Proposed Project Overview
3. Proposed Project Partners
4. Baseline Information
5. Requirements Analysis
6. Proposed Project Architecture
7. Proposed Technical Design
8. Feasibility Assessment
9. Benefit Cost Analysis
10. Potential Project Structure And Financing
11. Legal and Regulatory Considerations
12. Conclusions and Next Steps

Appendix A: Letters of Support and Authorization

Letters of support are provided from the following project partners:

- **The local utility, PSE&G**
- **The Highland Park Board Of Education**
- **The Housing Authority**
- **AHEPA Senior Housing**
- **Stop and Shop (Ahold USA) – a secondary site, included for completeness**
- **Resolution engaging Gabel Associates as project consultant**

Appendix A-1: Letter of Support from PSE&G

Public Service Electric and Gas Company
80 Park Plaza – T4, Newark, NJ 07102

PSE&G

March 21, 2017

The Honorable Gayle Brill Mittler
Mayor, Highland Park
221 S. Fifth Avenue
Highland Park, NJ 08904

Dear Mayor Brill Mittler

This correspondence will serve to demonstrate PSE&G's support of your application to the Town Center Distributed Energy Resource Microgrid Feasibility Study Incentive program. PSE&G will work with Highland Park officials and its consultant to develop and submit your feasibility study, if selected for funding.

PSE&G will support your study in the following ways:

- PSE&G will provide building load data for all buildings included in your microgrid feasibility study, contingent on receiving approval from the owners of each of the buildings to release its electric and gas load data to the community or its consultant.
- PSE&G will provide technical support to Highland Park's consultant in the development of your feasibility study. Release of any confidential or proprietary technical information will require the execution of a Non-Disclosure Agreement between all parties.

Mr. Frank Lucchesi will be the primary point of contact for PSE&G to coordinate our efforts with your team. Please feel free to reach out to me at 856-778-6705 if you have any additional questions.

Sincerely,

Michael Henry
Distribution Business Team Leader

Appendix A-2: Letter of Support from Highland Park Board of Education

HIGHLAND PARK
PUBLIC SCHOOLS
www.hpschools.net

SUPERINTENDENT DR. SCOTT TAYLOR
taylor@hpschools.net
135 Mansfield St. Highland Park NJ.08904
(732) 572-2400, EXT 2813

March 20, 2017

The New Jersey Board of Public Utilities
44 S. Clinton Avenue
Trenton, NJ 08625

Highland Park Borough, the community in which I have lived for over 22 years and that I currently serve as school district superintendent is preparing a proposal to the board of public utilities for funding of a Town Center Microgrid Feasibility Study. The Highland Park Public School District Central Office located in the Bartle School, the Highland Park Middle School and the Highland Park High School are being considered for inclusion as part of the study.

The school district fully supports the idea of a microgrid in Highland Park since it will provide much needed resilient power in the case of extended outages. I have worked closely with the mayor to offer my support as district representative for participation in the study effort. The school district central office and schools play vital roles in our community since they are the hubs of communication with the parent/guardian community and because the schools house the computer network's primary servers (email, student information, etc.).

Highland Park's schools look forward to participating in the proposed study to explore this opportunity further and will be engaged in discussions and planning with borough leadership every step of the way.

Respectfully,

Dr. Scott Taylor
Superintendent- Highland Park Public Schools
Adjunct Professor- Rutgers University and Montclair University
Facilitator- Academy for Social Emotional Learning in Schools (sel.esc.edu)

Appendix A-3: Letter of Support from Highland Park Housing Authority

HOUSING AUTHORITY
OF THE
BOROUGH OF HIGHLAND PARK

242 SOUTH SIXTH AVENUE
HIGHLAND PARK NJ 08904

March 17, 2017

To: The New Jersey Board of Public Utilities

From: Highland Park Housing Authority

Samuel Kronman Building, 242 South 6th Avenue

Re: Letter of Support for Micro grid Study

We understand that our community is preparing a proposal to the BPU for funding of a Town Center Micro grid feasibility study. Based on preliminary conceptual studies for the project, our facility is being considered for inclusion as part of the solution. We support the idea of a micro grid in our town to provide more resilient power in the case of extended outages, and offer our support for participation in the study effort. Our facility plays a vital role in our community. We have a total of 112 residents living at the Samuel Kronman building. They are either senior or disabled. Our residents are proud residents of this Borough and many of them are actively involved in the community and the senior center. We look forward to participating in the proposed study to explore that opportunity further.

If you have any further questions or need further clarification, please do not hesitate to call me at (732) 572-4420.

Sincerely,

Runi Sriwardena, Director of Housing HPHA

Appendix A-4: Letter of Support from AHEPA Senior Housing

AHEPA-HIGHLAND
APARTMENTS

Friday, March 17, 2017

To: The New Jersey Board Of Public Utilities
From: Ahepa Highland Apartments
Re: Letter Of Support For Microgrid Study

We understand that our community is preparing a proposal to the BPU for funding of a Town Center Microgrid feasibility study. Based on preliminary conceptual studies for the project, our facility is being considered for inclusion as part of the solution. We support the idea of a microgrid in our town to provide more resilient power in the case of extended outages, and offer our support for participation in the study effort. Our facility plays a vital role in our community, our building is an, 'independent senior living community for seniors 55 and older' some of our seniors have medical challenges that require machines and a guarantee of constant energy flowing into their unit. Having the security of a power grid will make our community a much safer living environment for our aging tenants.
We look forward to participating in the proposed study to explore that opportunity further.

Thank you.

Sincerely,

Jeniffer Saavedra
Property Manager
Ahepa Highland Apartments

CC; Richard Maygua
District Manager

a conifer community
www.ahepahighlandapartments.com
237 SOUTH SIXTH AVENUE HIGHLAND PARK NJ 08904
[E] ahepahighland@conifercllc.com [P] (732) 572 0700 [F] (732) 572 0850 [TTY] (800) 852 7899

Appendix A-5: Letter Of Support From Stop and Shop (a secondary site)

Ahold

March 22, 2017

To: The New Jersery Board of Public Utdities

From: Ahold USA

Re: Letter of Support for Microgrid Study

We understand that the community is preparing a proposal to the BPU for funding of a Town Center Microgrid feasibility study. Based on preliminary conceptual studies for the project, our facility is being considered for inclusion as part of the solution. We support the idea of a microgrid in the town to provide more resilient power in the case of extended outages, and offer our support for participation in the study effort. Our facility plays a vital role in the community, and we look forward to participating in the proposed study to explore that opportunity further.

Thank You,

Craig Besse
Manager of Energy and LEED
Ahold USA
Craig.besse@aholdusa.com

Appendix A-6: Resolution Authorizing Engagement Of Gabel Associates, Inc.

BOROUGH OF HIGHLAND PARK
NO. 9-16-254

RESOLUTION: Finance Committee

WHEREAS "The Electric Discount and Energy Competition Act," P.L. 1999 c. 23 ("EDECA") authorizes the New Jersey School Boards' Association ("NJSBA") to obtain electricity and other energy-related services for local boards of education on an aggregated basis; and

WHEREAS, NJSBA has formed the Alliance for a Competitive Energy Services hereinafter referred to as "ACES" a Cooperative Pricing System (E88-01-ACESCPS) to effectively obtain electricity and other energy-related services for its members, and

WHEREAS, N.J.S.A. 40a 11-10(b) authorizes municipalities to enter into cooperative pricing agreements, and

WHEREAS, ACES has offered voluntary participation in a cooperative pricing system for the energy-related services to municipalities and counties, and

WHEREAS, the Borough of Highland Park ("Participant") desires to participate in the ACES Cooperative Pricing System, and

WHEREAS, NJSBA and the New Jersey Association of School Administrators ("NJASA") has created, and is also offering, the ACESplus Program, which is designed to assist participating government entities with the evaluation and implementation of certain energy related programs, and

WHEREAS, Participant desires to participate in the ACESplus Program, and

WHEREAS, the NJSBA, as the Lead Agency, via its professional energy consultant, will work with the Participant to evaluate, develop and administer an RFP process for energy related services and provide related services all in accordance with the requirements of the Local Public Contracts Law (N.J.S.A. 40A 11-4.6 & 4.1), EDECA and a proposal on file with the Borough Clerk and which is available for inspection during regular Borough business hours.

NOW, THEREFORE, BE IT RESOLVED by the Borough Council of the Borough of Highland Park, as follows:

1. This resolution shall be known and may be cited as the "ACES Cooperative Pricing and ACESplus Program Resolution of the Borough of Highland Park."

2. Pursuant to the provisions of N.J.S.A. 40A 11-10(b), the Mayor and Clerk of the Borough of Highland Park are hereby authorized and directed to enter into the ACES Cooperative Pricing System Agreement and accept and execute the Proposal from Gabel Associates on file in the Office of the Borough Clerk.

Kathleen Kovach, Administrator/CFO or her designee is hereby authorized and directed to work with the Lead Agency, via its professional energy consultant for the Participant under the ACESplus Program as authorized by, and in accordance with the requirements of, the Local Public Contracts Law (N.J.S.A. 40A 11-4.6 and 4.1), EDECA and the Proposal.

Appendix A-6 (pg 2): Resolution Authorizing Engagement Of Gabel Associates, Inc.

3 The New Jersey School Boards Association, through ACES and its professional energy consultant, shall be responsible for complying with the "Local Public Contracts Law," N.J.S.A. 40A 11-1 1 *et seq* and all other applicable laws in connection with the preparation, bidding, negotiation and execution of contracts in connection with the ACES Cooperative Pricing System and the ACESplus Program

ADOPTED: September 6, 2016
ATTEST:

Joan Hullings, Borough Clerk

I, Joan Hullings, Borough Clerk of the Borough of Highland Park, County of Middlesex, New Jersey, do hereby certify the above to be a true copy of a Resolution adopted by the Borough Council of said Borough at its meeting on the 6th day of September 2016.

Joan Hullings, Borough Clerk

RECORD OF COUNCIL VOTES

Council Member	Ayes	Nays	Abstain	Absent
Erickson				
Frie				
Foster-Dublin				
George				
Walsh				
Welkovits				

Appendix B: Feasibility Considerations and Criteria

Based on experience that the Study Team has with other microgrid projects, the following set of feasibility considerations and criteria will be used to help inform project feasibility assessment. These factors have been adapted from study requirements for the NY PRIZE microgrid studies. These areas of investigation will be used to guide the feasibility study, but are not intended as hard requirements, specifications, or required tasks.

Task 1 Requirements Definition

Define the technical requirements that will drive design and evaluation.

Sub Task 1.1 Baseline Data Collection

Work with the Project Team, especially the utility and load center partners, to collect all the information necessary for subsequent analysis steps. Clear and reconciled historical usage profiles are a key required data element, for both electricity use and thermal energy (heating of water and space). Estimate variations in load based on expected outage scenarios.

Sub Task 1.2 Identify Minimum Required Capabilities

Define minimum required capabilities:

- Serves a group of physically separated critical facilities located on one or more properties involving multiple rights-of-way.
- The primary generation source capacity cannot be totally diesel fueled generators.
- A combination of generation resources must provide on-site power in both grid-connected and islanded mode.
- Must be able to form an intentional island.
- Must be able to automatically separate from grid on loss of utility source and restore to grid after normal power is restored.
- Must comply with manufacturer's requirements for scheduled maintenance intervals for all generation; plan on intermittent renewable resources that will be utilized toward overall generation capacity only if paired with proper generation and/or energy storage that will allow 24 hours per day and 7 days per week utilization of the power produced by these resources.
- It also needs to follow system load and maintain system voltage within ANSI c84-1 standards when islanded.
- Include a means for two-way communication and control between the community microgrid owner/operator and the local distribution utility through automated, seamless integration. Include processes to secure control/communication

systems from cyber-intrusions/disruptions and protect the privacy of sensitive data.

- Provide power to critical facilities and a diverse group of customers connected directly to the microgrid—diversity should apply to customer type (e.g. residential, small commercial, industrial, institutional, etc.) and overall demand and load profile.
- Must include an uninterruptible fuel supply or minimum of one week of fuel supply on-site.
- Demonstrate that critical facilities and generation are resilient to the forces of nature that are typical to and pose the highest risk to the location/facilities in the community grid. Describe how the microgrid can remain resilient to disruption caused by such phenomenon and for what duration of time.
- Provide black-start capability.

Sub Task 1.3 Define Preferable Microgrid Capabilities

Define incremental capabilities that provide additional value:

- Integrate and demonstrate operation of advanced, innovative technologies in electric system design and operations, including, but not limited to, technologies that enable customer interaction with the grid such as, Microgrid Logic Controllers, Smart Grid Technologies, Smart Meters, Distribution Automation, and Energy Storage;
  - Include an active network control system that optimizes demand, supply and other network operation functions within the microgrid;
  - Include energy efficiency and other demand response options to minimize new microgrid generation requirements;
  - Address installation, operations and maintenance and communications for the electric system to which interconnection is planned (e.g., underground networks, overhead loops, and radial overhead systems);
  - Identify energy market opportunities to deliver innovative services to end use customers;
  - Perform a comprehensive cost/benefit analysis that includes, but is not limited to, the community, utility and developer's perspective;
  - Leverage private capital to the maximum extent possible as measured by total private investment in the project and the ratio of public to private dollars invested in the project;
  - Involve clean power supply sources that minimize environmental impacts, including local renewable resources, as measured by total percentage of community load covered by carbon-free energy generation, and;
  - Demonstrate tangible community benefits, including but not limited to, (e.g., jobs created, number of customers served, number of buildings affected, scale of energy efficiency retrofits, etc.)

- Incorporate innovation that strengthens the surrounding power grid and increases the amount of actionable information available to customers—providing a platform for customers to be able to interact with the grid in ways that maximize its value.

Task 2: Develop A Technical Design Sufficient For Feasibility Assessment

Develop a proposed project architecture, component-level technical design, and system configuration for the proposed community microgrid in accordance with the following sub tasks:

Sub Task 2.1 Proposed Microgrid Infrastructure and Operations

- Identify a simplified equipment layout diagram and a one-line diagram of the proposed microgrid, include location of the distributed energy resources (DER) and utility interconnection points. Identify new and existing infrastructure that will a part of the microgrid.
- Define how the proposed microgrid will operate under normal and emergency conditions. Include a description of normal and emergency operations.

Sub Task 2.2 Load Characterization

- Quantify the electrical and thermal loads served by the microgrid when operating in islanded and parallel modes: Peak kW, Average kW, annual/monthly/weekly KWh, annual/monthly/weekly BTU (consumed and recovered) and identify the location of the electrical loads on the simplified equipment layout and one-line diagrams.
- Quantify the hourly load profile of the loads included in the microgrid and identify the source of the data. If hourly loads are not available, the best alternative information shall be provided.
- Size the loads to be served by the microgrid including a description of any redundancy opportunities (ex: n-1) to account for equipment downtime.

Sub Task 2.3 Distributed Energy Resources Characterization

- Identify the following information regarding Distributed Energy Resources (DER) and thermal generation resources that are a part of the microgrid:
  - Type (DG, CHP, PV, boiler, solar water heater etc.),
  - Rating (kW/BTU), and;
  - Fuel (gas, oil etc.).
- Identify new DER as required by the microgrid, including approximate location integration methods. Integrate simplified equipment layout and one-line diagrams. Differentiate between new and existing resources.

- Evaluate the adequacy of the DERs and thermal generation resources to continuously meet electrical and thermal demand in the microgrid.
- Evaluate how resilient the DERs and thermal generation resources will be to the forces of nature (severe weather) that are typical to and pose the highest risk to their operation (e.g., reduced or zero output due to snow cover over PV panels, potential flooding of low lying areas, etc.
- Assess the fuel sources for DER, if required. Quantify how many days of continuous operation of the microgrid can be achieved with current fuel storage capability. Identify if additional fuel storage is required.
- Identify operational capability of the DER based on the needs of this application, including black start, load-following, part-load operation, ability to maintain voltage and frequency, capability to ride-through voltage and frequency events in islanded mode, and capability to meet interconnection standards in grid-connected mode.

Sub Task 2.4 Electrical and Thermal Infrastructure Characterization

- Identify the electrical infrastructure (feeders, lines, relays, breakers, switches, current and potential transformers (CTs and PTs)) and thermal infrastructure (steam, hot water, cold water pipes) that are a part of the microgrid. Identify the electrical and thermal infrastructure on the simplified equipment layout (with approximate routing) and one-line diagrams (electrical only). Differentiate between new, updated and existing infrastructure.
- Assess how resilient the electrical and thermal infrastructure will be to the forces of nature that are typical to and pose the highest risk to the location/facilities. Describe how the microgrid can remain resilient to disruption caused by such phenomenon and for what duration of time. Discuss the impact of severe weather on the electrical and thermal infrastructure.
- Determine how the microgrid will be interconnected to the grid. Will there be multiple points of interconnection with the grid? What additional investments in utility infrastructure may be required to allow the proposed microgrid to separate and isolate from the utility grid? Provide a written description of the basic protection mechanism within the microgrid boundary.

Sub Task 2.5 Microgrid and Building Controls Characterization

- Determine the microgrid control architecture and how it interacts with DER controls and Building Energy Management Systems (BEMS), if applicable. Identify the locations of the microgrid and building controls on the simplified equipment layout diagram. Differentiate between new and existing controls.
- Identify the services that could be provided by the microgrid controls, potentially including, but not limited to the following:
    - Automatically connecting to and disconnecting from the grid

- Load shedding schemes
- Black start and load addition
- Performing economic dispatch and load following
- Demand response
- Storage optimization
- Maintaining frequency and voltage
- PV observability and controllability forecasting
- Coordination of protection settings
- Selling energy and ancillary services
- Data logging features

- Determine how resilient the microgrid and building controls are. Discuss the impact of severe weather on the microgrid and building controls.

Sub Task 2.6 Information Technology (IT)/Telecommunications Infrastructure Characterization

- Identify the IT/Telecommunications Infrastructure (wide area networks, access point, Ethernet switch, cables etc.) and protocols required by the microgrid for its own operation. Identify the IT and telecommunications infrastructure on the simplified equipment layout diagram. Differentiate between new and existing infrastructure.
- Identify the communications within the microgrid and between the microgrid and the utility. Can the microgrid operate when there is a loss in communications with the utility? How resilient are the IT and telecommunications infrastructure?

Task 3: Assessment of Microgrid's Feasibility

Assess the commercial and financial feasibility of the proposed microgrid project in accordance with the following requirements.

Sub Task 3.1 Commercial Feasibility – Customers

Identify the commercial terms/relationship between participants in the microgrid project, products expected to be produced by the microgrid and arrangements for sharing of benefits, as guided by consideration of the following:

- Identify the number of individuals affected by/associated with critical loads should these loads go unserved (e.g., in a storm event with no microgrid).
- Identify any direct/paid services generated by microgrid operation, such as ancillary services, or indirect benefits, such as improved operation, to the utility or PJM. If any services are identified, what are they?
- Identify each of the microgrid's customers expected to purchase services from the microgrid.

- Identify other microgrid stakeholders; what customers will be indirectly affected (positively or negatively) by the microgrid?
- Define the relationship between the microgrid owner and the purchaser of the power.
- Identify which party/customers will purchase electricity during normal operation. During islanded operation? If these entities are different, describe why.
- Identify the planned or executed contractual agreements with critical and non-critical load purchasers.
- Identify any other potential energy commodities (such as steam, hot water, chilled water) that the microgrid will provide to customers.

Sub Task 3.2 Commercial Feasibility - Value Proposition

Characterize the value the microgrid is expected to provide directly to its participants, to the local community at large, the local electric distribution utility, and the state of New Jersey, as guided by the following considerations:

- What benefits and costs will the community realize by the construction and operation of this project?
- How would installing this microgrid benefit the utility? (e.g., reduce congestion or defer upgrades)? What costs would the utility incur as a result of this project?
- Describe the proposed business model for this project. Include an analysis of strengths, weaknesses, opportunities, and threats (SWOT) for the proposed business model.
- Are there any characteristics of the site or technology (including, but not limited to, generation, storage, controls, information technology (IT), automated metering infrastructure (AMI), other, that make this project unique?
- What makes this project replicable? Scalable?
- What is the purpose and need for this project? Why is reliability/resiliency particularly important for this location? What types of disruptive phenomenon (weather, other) will the microgrid be designed for? Describe how the microgrid can remain resilient to disruption caused by such phenomenon and for what duration of time.
- Describe the project's overall value proposition to each of its identified customers and stakeholders, including, but not limited, the electricity purchaser, the community, the utility, the suppliers and partners, and the State.
- What added revenue streams, savings, and/or costs will this microgrid create for the purchaser of its power?

- How does the proposed project promote state policy objectives (e.g., the NJ BPU Microgrid Report, the Energy Master Plan)?
- How would this project promote new technology (including, but not limited to, renewable and dispatchable generation, energy storage, controls, IT, other)?

Sub Task 3.3 Commercial Feasibility - Project Team

Identify the structure of the project team needed to implement the project, including the roles, strengths and resources of its members and other necessary partners.

- Describe the current status and approach to securing support from local partners such as municipal government, community groups and residents.
- Identify the role of each team member (including, but not limited to, applicant, microgrid owner, contractors, suppliers, partners) play in the development of the project, including construction and operation activities.
- Are public/private partnerships used in this project? If yes, describe this relationship and why it will benefit the project.
- Identify the financial strength of the applicant. If the applicant is not the eventual owner or project lead, describe the financial strength of those entities.
- For identified project team members, identify their qualifications and performance records.
- Identify potential contractors and suppliers. What services will each provide and what is the relationship to the project? What types of team members will be required and what is the proposed approach to selecting and contracting?
- Identify potential financiers or investors. Characterize potential approaches to securing project financing? Will other members of the project team contribute any financial resources?
- Are there legal and regulatory issues that need to be addressed? Identify the process by which they will be resolved.

Sub Task 3.4 Commercial Feasibility – Creating and Delivering Value

Characterize how value is delivered to project participants, as guided by the following considerations:

- What assets does the applicant and/or microgrid owner already own that can be leveraged to complete this project?
- How do the design, technology choice, and/or contracts ensure that the system balances generation and load?
- What permits and/or special permissions will be required to construct this project? Are they unique or would they be required of any microgrid? Why?

- What is the proposed approach for developing, constructing and operating the project?
- How are benefits of the microgrid passed to the community? Will the community incur any costs? If so, list the additional costs.
- What will be required of the utility to ensure this project creates value for the purchaser of the electricity and the community?
- Have the microgrid technologies (including but limited to: generation, storage, controls) been used or demonstrated before? If yes, describe the circumstances and lessons learned.
- Describe the operational scheme, including, but not limited to, technical, financial, transactional and decision making responsibilities that will be used to ensure this project operates as expected.
- How does the project owner plan to charge the purchasers of electricity services? How will the purchasers' use be metered?
- Are there business/commercialization and replication plans appropriate for the type of project?

Sub Task 3.5 Financial Feasibility

Assess the financial viability for development and operation of the microgrid, as guided by consideration of the following factors:

- Identify the revenue streams and/or savings that will flow to the microgrid owner. Distinguish between fixed and variable cash flows.
- Identify the capital and operating costs that will be incurred by the microgrid owner. Distinguish between fixed and variable.
- Define a business model that satisfies investment requirements.
- Develop a potential financing structure for this project during development, construction and operation.

Sub Task 3.6 Legal and Regulatory Feasibility

Identify legal and regulatory considerations that affect microgrid design and operation, as guided by the following considerations:

- Describe the proposed project ownership structure and project team members that will have a stake in the ownership.
- Has the project owner been identified? If yes, who is it and what is the relationship to the applicant? If no, what is the proposed approach to securing the project owner?

- Does the project owner (or owners) own the site(s) where microgrid equipment/systems are to be installed? If not, what is the plan to secure access to that/those site(s)?
- What is the approach to protecting the privacy rights of the microgrid's customers?
- Describe any known, anticipated, or potential regulatory hurdles, as well as their implications that will need to be evaluated and resolved for this project to proceed. What is the plan to address them?

State of New Jersey
BOARD OF PUBLIC UTILITIES
44 SO. CLINTON AVENUE
THIRD FLOOR, SUITE 314 – P.O. BOX 350
TRENTON, NEW JERSEY 08625-0350

CHRIS CHRISTIE
GOVERNOR

KIM GUADAGNO
LT. GOVERNOR

RICHARD S. MROZ
PRESIDENT
TEL: (609) 777-3310
FAX: (609) 292-2264

April 17, 2017

Mayor Gayle Brill Mittler
Borough of Highland Park
221 S. Fifth Avenue
Highland Park, NJ 08904

Dear Mayor Mittler:

The NJBPU Town Center DER Microgrid Evaluation Team (Evaluation Team) has received your application for a TC DER microgrid feasibility study incentive.

BPU has received 13 proposals for feasibility study incentives. The Board's approved DER microgrid line item budget is $1 million. The 13 proposals significantly exceed that budget. The TC DER evaluation team is requiring that you submit a best and final offer (BAFO) for your proposal. This BAFO should include your estimated breakdown of the budget for the prime investigator and all subcontracts including any estimated fees to be paid to the EDC/GDC. The above noted items, the BAFO and the budget breakdown of the prime investigator and subcontractors should be submitted to TCDERmicrogrid@bpu.nj.gov by close of business (COB) 5:00 p.m. on May 1, 2017. Non-submittal of the additional items, the BAFO and budget breakdown will result in a non-completeness determination of the proposal.

As noted in the TC DER microgrid feasibility study application, the Board has the sole discretion over the approval of projects and awards of incentives, and may change criteria or available funding at any point during the duration of the program.

Sincerely,

Michael Winka
Senior Policy Advisor

SHOP IT.
WALK IT. HIGH LAND PARK LIVE IT.
PARK IT!

THE BOROUGH *OF* HIGHLAND PARK
COUNTY OF MIDDLESEX, STATE OF NEW JERSEY
GAYLE BRILL MITTLER, MAYOR
221 SOUTH 5TH AVENUE
HIGHLAND PARK, NEW JERSEY 08904
TEL. (732) 777-6001
FAX (732) 777-6006

April 28, 2017

Michael Winka
New Jersey Board of Public Utilities
44 S. Clinton Avenue
Trenton, New Jersey 08625

RE: Highland Park Response To BPU Request For Additional Information

Mr. Winka:

In response to the BPU's letter of April 17, 2017, Highland Park is pleased to provide additional information about our previously submitted application to the Town Center Distributed Energy Resource (TC-DER) Microgrid Study Solicitation.

We have worked with our project team to prepare a "Best And Final Offer" regarding the funding requested, and to breakout the project budget in more detail. Our original proposal was for $135,000 in funding. **We hereby revise our proposal to be $130,000 in requested funding.** There will be no change to the microgrid project or study scope.

Our project is supported by two consultants: Gabel Associates and Burns Engineering. Based on the revised overall budget, $67,000 is allocated to Gabel Associates as project lead, and $63,000 to Burns Engineering. There are no other sub-contractors identified for the project. The utility (PSE&G) has submitted a letter of support, but has not asked for any funding for their participation in the study, and no funding is planned to support their involvement.

We appreciate the opportunity to provide this revised budget and break-out to the BPU. Please feel free to contact me at 732-336-0030 (brillmittlerhp@gmail.com).

Sincerely,

Mayor Gayle Brill Mittler
Borough of Highland Park

Town Center Distributed Energy Resources Microgrid Feasibility Study Report Requirements

As set forth in the MOU the Town Center (TC) Distributed Energy Resource (DER) Microgrid Feasibility Study Report should be of sufficient detail to demonstrate how the TC DER Microgrid's functional and technical requirements will be executed, the proposed approach to solve technical problems, and how project goals will be accomplished.

The TC DER Microgrid Feasibility Study Report should include an Executive Summary including all project definitions and special terms used in the Report.

The full report must include, but is not necessarily limited to, the following

1. Table of Contents

2. Project Name

3. Project Applicant – This should be the local government or state agency that is the MOU signatory.

4. Project Partners – This should include any agreements entered into by the partners.

5. Project location – This should include a detailed mapping of the boundaries on the TC DER microgrid within the municipality.

6. Project Description including a detailed description of all included critical facilities with a description of why they are critical facilities within the proposed TC DER Microgrid. The Project Description should include the following: [1]

    i. The electrical and thermal loads for each critical facility over the month and year. This should include a description and illustration of any variability in loads including daily, weekend or seasonal loads that impact on the peak, minimum and average loads.

    ii. The electric and thermal load of the total microgrid project over the month and year. This should include a description and illustration of any variability in loads including daily, weekend and seasonal loads that impact on the peak, minimum and average loads as well as the coincident loads of the overall system.

[1] The energy data in this section and the full report should be provided through metered data were available but may also be provided through simulated data from models such as EnergyPlus. If the data is simulated the specific software and model should be identified and available.

iii. The monthly and annual energy costs for each critical facility and the overall project including both energy and demand costs. This should include the monthly cost and any variations over the year that could impact demand costs.

iv. The square footage of each building and the total project.

v. The overall boundaries of the proposed project and distance between critical facilities should be provided. A map should be provided showing the locations of any Right of Way (ROW) crossings.

vi. The size of the available emergency shelter facilities and for what periods they can serve during and after an emergency.

vii. The specific FEMA Category Classification of each building and whether they are a state or federal designated critical or emergency facility.

viii. A listing of all potential permits, permit issuing agency, and general timeframe for issuance.

ix. Any previously installed EE or energy conservation measure (ECM) or currently implemented demand response (DR) measure.

6. A detailed description of the ownership/business model for the overall project including all procurement issues between the various local government and state government partners. This should include a detailed description of the statutory and regulatory provisions of proposed ownership models, EDC/GDC utility roles, as well as any billing systems for electricity and thermal energy.

7. A detailed description of the technology, business and operational protocol to be developed and/or utilized and the location within the TC DER Microgrid. This should include the following:

i. A detailed description of the proposed connections (electric, gas and/or thermal) of the critical facilities and the DER technologies.

ii. A one line diagram of the microgrid and location of the electrical connections to the EDC's facilities/equipment.

iii. A detailed description of the type of distribution system the TC DER would be interconnecting into (radial or network) and the interconnection procedures and requirements.

iv. A detailed description of how the TC DER will black start and operate and over what time period in island mode and in sync with the distribution system.

v. A detailed description of the NJBPU and EDC tariff requirements/issues including any smart grid or distribution automation upgrades proposed or under development by the EDC.

vi. A detailed description of the FERC and PJM tariff requirements/issues.

8. A detailed description of the overall cost including site prep, equipment and equipment installation, construction, operations and maintenance including a detailed construction schedule. This should include a detailed description of the overall energy costs for each critical facility and the overall project as well as any proposed ECM or DR measure to be constructed or operated within each critical facility and the overall project and its impact of the overall operation costs.

(Both 7 and 8 should be detailed through an available microgrid modeling efforts. Applicants must also demonstrate that their proposed project is consistent with the use of the Societal Benefit Charge as set forth in N.J.S.A. 48:3-60(a)(3)).

9. A detailed cash flow evaluation. This should also include a description of the potential revenue markets for any ancillary services, demand response including EE, capacity or energy markets and any available emission or energy certificate trading markets.

10. A detailed description of the potential financing of each location/critical facility and/or the overall project.

11. A detailed description of the benefits of the proposed Town Center DER Microgrid as well as the need for the proposed project. This should include an estimate of the value for reliability, resiliency, flexibility, sustainability including avoided environmental impacts such as air emissions, water usage, wastewater discharges, land use and waste generation, affordability and security.[2]

12. A general description of the communication system between the TC DER microgrid and the EDC's system. This should include a detailed description of distribution management systems and controls and all building controls.

13. The estimated timeframe for the completion of the construction and commencement of operations of the individual critical facilities and the overall project.

14. A description of the on-going work with the EDC and GDC.

The overall quality of the TC DER microgrid feasibility study report and the data provided will be one factor used by the Board to determine which projects proceed to a Phase 2 – Detailed Engineering Design and TC DER microgrid pilot.

[2] This valuation should follow the Grid Services and Technologies Valuation Framework developed by the USDOE in their Grid Modernization Initiative.

MEMORANDUM OF UNDERSTANDING
BETWEEN AND AMONG
THE NEW JERSEY BOARD OF PUBLIC UTILITIES,
AND
BOROUGH OF HIGHLAND PARK

THIS MEMORANDUM OF UNDERSTANDING ("MOU"), is made this _____ day of _____, 2017, by and between **The BOROUGH OF HIGHLAND PARK** ("Recipient") **and The NEW JERSEY BOARD OF PUBLIC UTILITIES** ("BPU" in general or "Board" when referring to Board of Commissioners) (collectively the "Parties") setting forth the roles and responsibilities of the Parties in connection with the Town Center Distributed Energy Resource (TCDER) Microgrid Feasibility Study Incentive Program ("Program").[1]

WHEREAS, the BPU is charged with the authority to ensure that safe, adequate, and proper utility services are provided at reasonable, non-discriminatory rates to all members of the public who desire such services and to develop and regulate a competitive, economically cost effective energy policy that promotes responsible growth and clean renewable energy sources while maintaining a high quality of life in New Jersey; and

WHEREAS, as set forth in N.J.S.A. 48:2-13, BPU is responsible for regulatory oversight of all necessary services for transmission and distribution of electricity and natural gas including but not limited to safety, reliability, metering, meter reading and billing; and

WHEREAS, the BPU is chair of the Energy Master Plan Committee and is responsible for the preparation, adoption and revisions of the Energy Master Plan (EMP) regarding the production, distribution, and conservation of energy in this State; and

WHEREAS, the BPU 2015 Energy Master Plan Update (EMP Update) established a new overarching goal to "Improve Energy Infrastructure Resiliency & Emergency Preparedness and Response" in response to several extreme weather events that left many people and businesses without power for extended periods of time. One "Plan for Action" policy

[1] Acronyms related to this program are referred to herein are as follows: Town Center (TC); Disributed Energy Resource (DER);

recommendation included in the EMP Update is to "Increase the use of microgrid technologies and applications for Distributed Energy Resources (DER) to improve the grid's resiliency and reliability in the event of a major storm."; and

WHEREAS, specifically, this new policy recommends that:

"The State [of New Jersey] should continue its work with the [United States Department of Energy], the utilities, local and state governments and other strategic partners to identify, design and implement Town Center DER microgrids to power critical facilities and services across the State."; and

WHEREAS, The Board approved the FY17 Clean Energy Program Budget which established as part of the Office of Clean Energy Distributed Resources Program, the Town Center DER Microgrid Program and budget.; and

WHEREAS, The BPU staff has, under the direction and approval of the Board, issued a full report and recommendations regarding the utilization of TCDER Microgrids and subsequently issued an application for this Program; and

WHEREAS, the Recipients who are Parties to this MOU freely and voluntarily, in full consideration of the costs and benefits incident hereto, submitted an application to participate in the Program; and

WHEREAS, BPU Staff issued a draft application for public comment regarding this Program on August 5, 2016, a public meeting to discuss the draft application on August 23, 2016, and written comments were received and considered and staff responses were published; and

WHEREAS, the Board, by virtue of proper procedure, and execution of this MOU, has determined that the Recipient's application is approved and incentive funds will be awarded to the Recipient, pursuant to the terms included herein;

NOW THEREFORE, in consideration of the promises and mutual representations, warranties, and covenants herein contained, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

I. INCORPORATION

All of the above recitals, the entirety of the TCDER Micrigrid Feasibility Study Incentive Program Application (attached hereto as Appendix A), the entirety of the Recipient's submitted application (Sumbittal letter which references recipient's application is attached hereto as Appendix B), The Best and Final Offer request letter and recipient's response thereto (attached hereto as Appendix C), and final Feasability Study Report Requirements (attache hereto as Appendic D) are hereby incorporated by reference into this MOU as if set forth at length herein.

II. SCOPE OF THE AGREEMENT

This MOU applies only to the Feasibility Study phase of the Program which encompasses the incentive award funding for the satisfactory completion and submission of the Recipient's TCDER Microgrid Feasibility Study only. Conformance to the terms of this MOU and timely completion of the Feasibility Study does not guarantee Recipient's future participation in this Program or any other related programs. Furthermore, the terms and conditions included herein represent the entire scope of this agreement and supersede all former representations whether written or verbally communicated.

III. DUTIES OF THE PARTIES

A. The Recipient will submit a complete and final TCDER Microgrid Feasibility Study (The Study) in accordance with the terms and conditions of this MOU and incoporated documents.

B. The Recipient shall have one (1) year from the date that this MOU is executed to complete The Study, unless a timely request for extension is submitted by the recipient for good cause and is granted by Board Staff.

C. Recipient shall include in the Feasibility Study a Conceptual Design that should be of sufficient detail to demonstrate how the TCDER Microgid functional and technical requirements will be executed, the proposed approach to solve technical problems, and how project goals will be accomplished. The Recipient's Conceptual Design shall include at a minimum: (1) Design Analysis including design narrative and design calculations for all diciplines, an intended specifications list, environmental permitting memorandum that identifies any and all required permits and the detailed outline of process required to obtain the identified permits; (2) Schematic or one-line concept drawings; (3) Conceptual cost estimate; (4) Preliminary construction schedule in bar chart format; and, (5) Project definitions and special conditions.

D. Recipient shall report to Board Staff regarding the status and progress of The Study upon request.

E. The Recipient is solely responsible for fully complying with the terms and conditions of this MOU, the above-referenced incorporated documents, and any and all duly executed subsequent agreements between the Parties.

F. Effective upon execution of this MOU, BPU agrees to firmly commit the sum of $130,000, to cover costs to be incurred by the Recipient to administer, complete, and deliver the Feasibility Study.

G. All requisitions, pay applications, and invoices submitted for costs or expenses associated with the Feasibility Study shall be subject to review and approval by Recipient according to its standard procedures. Upon approval, Recipient shall promptly submit to BPU for

payment all such requisitions, pay applications and invoices. In reviewing, approving, submitting and paying such requisitions, pay applications, Recipient and BPU shall be cognizant of and shall comply with the requirements of the New Jersey Prompt Payment Act, N.J.S.A. 2A:30A-1 et seq.

H. Recipient shall submit all final invoices of expenditures and a final draft of the Study within one year of the execution of this MOU or at the end of an approved extension pursuant to Section III B of this MOU.

I. Upon receipt of the Study and final invoices of expenditures, BPU Staff shall determine if the Study meets the requirements of the program and the MOU at Section III C. If BPU Staff determines that the Study does not meet any requirement(s), BPU Staff shall provide to Recipient a list of requested revisions which recipient shall forward to the consultant that completed the Study. The consultant shall then be afforded a reasonable period of time to make the requested revisions and will then resubmit the Study. Final payment shall be made upon BPU Staff approval of the Study.

J. Incentive funds for this program may not be diverted to pay for any work conducted prior to the date of execution of this MOU. Furthermore, Incentive funds must only be used in furtherance of the completion of the Feasibility Study specifically.

K. Recipient shall procure the services necessary to complete the Feasibility Study in compliance with N.J.S.A. 52:32-2, N.J.S.A. 52:34-9.1, et seq., and N.J.S.A. 52:35-1, et seq., and any and all applicable State and local procurement laws, rules, and procedures.

L. The BPU reserves the right to withhold or deny incentive funding for any invoice items submitted by Recipient that BPU determines to be unlawful or otherwise inappropriate for this Program.

IV. DESIGNATED REPRESENTATIVES

Written communication between the Parties for the purpose of this MOU as defined above shall be delivered to the following representatives.

New Jersey Board of Public Utilities
Attn: Michael Winka Sr Policy Advisor
44 S. Clinton Ave, Trenton, NJ 08625
Michael.Winka @bpu.nj.gov

Borough of Highland Park
Attn:
Addresss
XXXX.YYY@abc.gov

V. MISCELLANEOUS

A. No Personal Liability. No official or employee of BPU shall be charged personally by Recipient, its employees, agents, contractors, or subcontractors with any liability or held liable to Recipient, its employees, agents, contractors, or subcontractors under any term or provision of this MOU or because of its execution or attempted execution or because of any breach or attempted or alleged breach of this MOU.

No official or employee of Recipient shall be charged personally by BPU, its employees, agents, contractors, or subcontractors with any liability or held liable to BPU, its employees, agents, contractors, or subcontractors under any term or provision of this MOU or because of its execution or attempted execution or because of any breach or attempted or alleged breach of this MOU.

C. Captions. The captions appearing in this MOU are inserted and included solely for convenience and shall not be considered or given effect in construing this MOU, or its provisions, in connection with the duties, obligations, or liabilities of the Parties or in ascertaining intent, if a question of intent arises. The preambles are incorporated into this paragraph as though set forth in verbatim.

D. Entirety of Agreement. This MOU and its attachments represent the entire and integrated agreement between the Parties and supersedes any and all prior agreements or understandings (whether or not in writing). No modification or termination hereof shall be effective, unless in writing and approved as required by law.

E. Amendments. This MOU may be amended by the written request of any Party and with the consent of the other Party. Any proposed amendment of this MOU shall be submitted by one Party to the other Party at least five (5) business days prior to formal discussion or negotiation of the issue. Any agreed amendment of this MOU shall be set forth in writing and signed by an authorized representative of each Party in order to become effective.

F. No Third-Party Beneficiaries. This MOU does not create in any individual or entity the status of third-party beneficiary, and this MOU shall not be construed to create such status. The rights, duties, and obligations contained in this MOU shall operate only between the Parties and shall inure solely to the benefit of the Parties. The provisions of this MOU are intended only to assist the Parties in determining and performing their obligations under this MOU. The Parties intend and expressly agree that only the Parties shall have any legal or equitable right to enforce this MOU, to seek any remedy arising out of a Party's performance or failure to perform any term or condition of this MOU, or to bring any action for breach of this MOU.

G. No Assignment. This MOU shall not be assignable, but shall bind and inure to the benefit of the Parties hereto and their respective successors.

H. Governing Law. This MOU and the rights and obligations of the Parties shall be interpreted, construed, and enforced in accordance with the laws of the State of New Jersey.

I. Authority. By execution of this MOU, the Parties represent that they are duly authorized and empowered to enter into this MOU and to perform all duties and responsibilities established in this MOU.

J. Term. This MOU shall be effective as of the date hereinabove written and, unless terminated sooner as set forth below, shall remain in effect until the completion of the Feasibility Study and payment of funds as set forth in Section III.

K. Termination. Board Staff and the Recipient may terminate this contract in whole, or in part, when both parties agree that the continuation of the project would not produce beneficial results commensurate with the expenditure of funds. The two parties shall agree upon the termination conditions including the date on which the termination shall take effect, and, in case of partial terminations, the portion to be terminated.

K. Counterparts. This MOU may be executed in duplicate parts, each of which shall be an original, but all of which shall together constitute one (1) and the same instrument.

|SIGNATURE PAGE FOLLOWS|

IN WITNESS WHEREOF, the parties have signed this Memorandum of Understanding the date first written above.

Witness: Borough of Highland Park

_____ By: _____

……..

Dated: _____

Witness: New Jersey Board of Public Utilities

_____ By: _____

Richard S. Mroz, President

Dated: _____

APPROVED AS TO FORM:
Andrew Kuntz
Attorney General, State of New Jersey

By: _____