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

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 HUDSON COUNTY FOR PHASE I FEASIBILITY STUDY	))))	ORDER DOCKET NO. QO17060635

Party of Record:

Thomas DeGise, County Executive, Hudson County

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 County of Hudson submitted an application to the Board.

The Hudson County Advance Microgrid ("HCAM" or "Project") was submitted by the Hudson County and is located in Secaucus Township. The Project core partners include Hudson County, the Township of Secaucus, the Secaucus School District, Secaucus Housing Authority, Meadowview Hospital and Alaris Health at the Fountains. The Project's critical facilities are centered around the Meadowview Complex, which contains multiple critical facilities including the Meadowview Psychiatric Hospital and Hudson County's Juvenile Detention Center, Hudson County's 911 Call Center, multiple Hudson County office buildings, Alaris Health at the Fountains, Secaucus Housing Authority, and the Secaucus Town Hall and Police Department. Based on the list of partners and proposed critical facilities there are three FEMA category IV designated facilities and six FEMA category III facilities that can provide shelter in an emergency. The estimated total annual usage of the proposed Project is 147,617 MM Btus. The Meadowview Psychiatric Hospital which is a FEMA category IV facility has an estimated combined energy usage of approximately 231,100 Btu's per square foot.

There are no existing DER facilities in the proposed Project buildings. The Project will evaluate new power capacity which may include fuel cells, solar and dispatchable generation such as combined heat and power ("CHP") and other new electric infrastructure to allow the proposed Project to operate during normal and emergency conditions. The Project proposes to use

Hybrid Optimization of multiple energy resources ("HOMER") Pro microgrid software to model the proposed Project as well as the Rutgers' CEEEP Cost/Benefit model. The estimated timeframe to complete the feasibility study is 12 months. Public Service Gas and Electric ("PSE&G") is the electric utility and the natural gas utility for the Township of Secaucus. PSE&G provide a letter of support (LOS) to participate in the feasibility study.

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 $150,000 for Hudson County 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:

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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 HUDSON COUNTY FOR PHASE I
FEASIBILITY STUDY

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Hudson County Advanced Microgrid (HCAM)

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www.gbdtoday.com

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2. *Project Description*

Hudson County is geographically the smallest and most densely populated county in New Jersey and is the sixth-most densely populated county in the United States. Its density, close proximity to Manhattan and its nexus with the various World Trade Center attacks places it on the front lines of combatting terrorism.

The County is home to sixty-one state and national critical infrastructure assets. These assets span numerous Department of Homeland Security (DHS) sectors and include: transportation; healthcare; energy; chemical/hazardous material; petroleum; communications; banking/finance; information technology; emergency services; government facilities; water; commercial; food/agriculture and the postal/shipping sectors. This wide array of critical assets serves to make Hudson County the number one county for critical infrastructure sites in New Jersey and may serve as an attractive target for potential terrorists.

HCAM presents the perfect case for an advanced microgrid as it meets the BPU's criteria for multiple critical facilities in a single municipality that provide emergency services under "black sky" conditions in a cost-effective manner, as well as operate in a cost-effective manner 24-7 under "blue sky" conditions. HCAM will provide a great benefit to the distribution grid by generating power during "blue sky" days, increasing resiliency during "black sky" days, providing ancillary services that will increase the reliability of the grid, and increasing the efficiency of the grid due to lower line losses. It will keep emergency services functioning in a densely-populated area, while also providing shelter for those who are displaced. Furthermore, HCAM is in a strategically favorable location because it is located on an evacuation route. Meadowview Complex's runs parallel to the New Jersey Turnpike and is within a mile of both the New Jersey Turnpike and NJ-3, both of which are evacuation routes

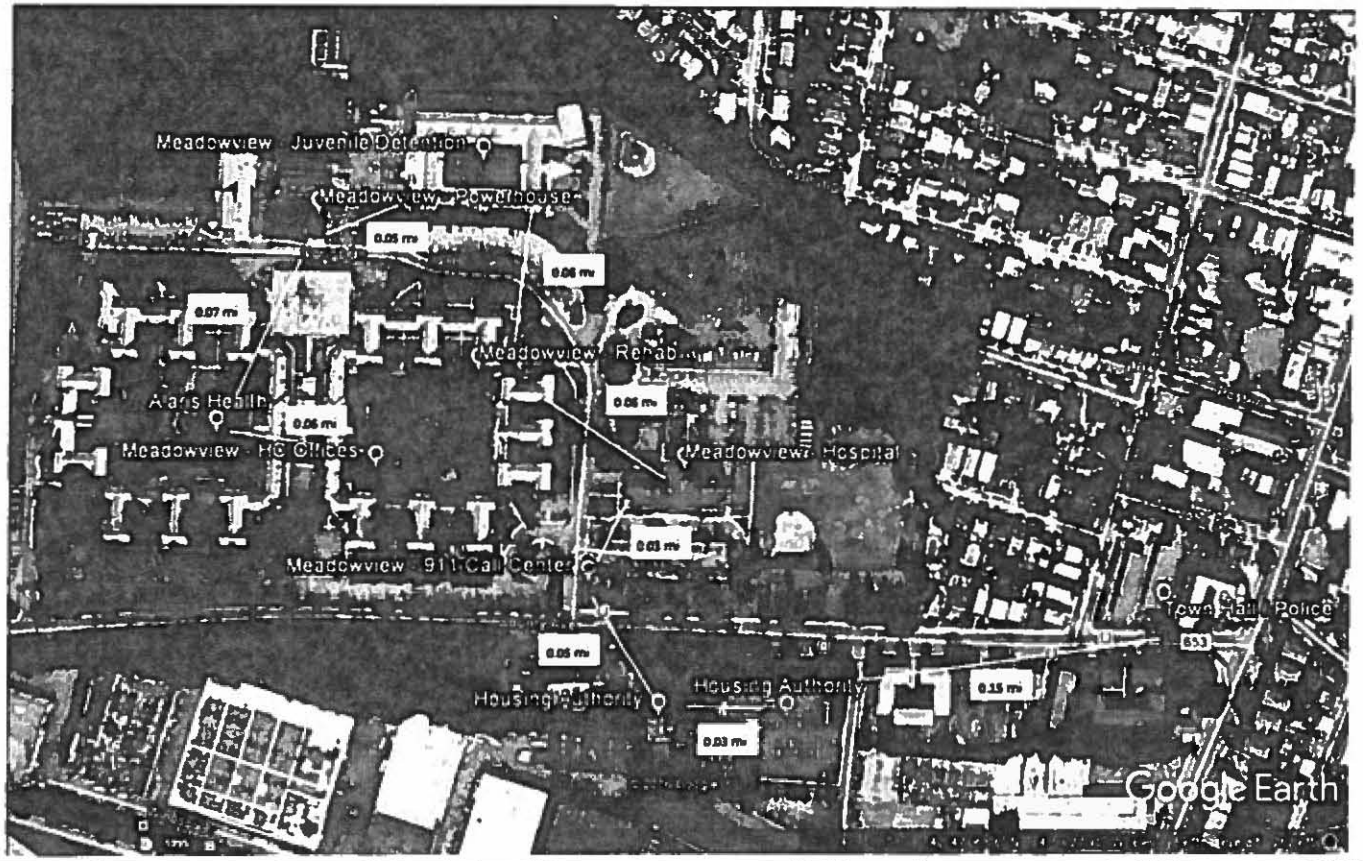
The Hudson County Microgrid Stakeholder Group includes the Hudson County Administration, the Hudson County Improvement Authority, the Department of Public Property & Roads, the Department of Engineering, the Office of Emergency Management, the Department of Parks and Recreation, and the Law Department. The genesis of this stakeholder group was due to the mounting need for ways to harden the infrastructure of several critical assets in the Town of Secaucus. The external stakeholders include critical sites that are represented by the Town of Secaucus, the Secaucus Housing Authority, Alaris Health at the Fountains, and several other privately-owned facilities. The primary focus of the feasibility study is set on a cluster of sites in and around Meadowview Complex at 595 County Avenue, Secaucus, New Jersey. Included within Meadowview Complex is the Meadowview Psychiatric Hospital, which was identified as a Tier 2 Town Center site by the New Jersey Town Centers Distributed Energy Resource Microgrids Potential: Statewide Geographic Information Systems Analysis -Technical Report prepared by NJIT's Center for Resilient Design and Regional Plan Association. This cluster will

be a demonstration for how other microgrid town centers will be feasible throughout the County.

HCAM's Main Cluster is centered around the Meadowview Complex, which contains multiple critical facilities. The Meadowview Psychiatric Hospital and Hudson County's Juvenile Detention Center are located there, which house populations that are hard to move in the event of an emergency. In addition, Hudson County's 911 Call Center, a powerhouse, a few small healthcare facilities, and multiple Hudson County office buildings are on that site, all of which provide needed services during "black sky" conditions. Within the confines of the complex is Alaris Health at the Fountains, which is a large healthcare facility that also functions as Hudson County's Primary Regional Distribution Site (RDS). A RDS is a location for the receipt, storage, and distribution of Strategic National Stockpile (SNS) assets to be used after an exposure event has occurred to prevent or limit the effects of disease. Across the street from the Meadowview Complex is 175 public housing units in the Secaucus Housing Authority, which can act as a shelter if needed. The final facility included in the Main Cluster is the Secaucus Town Hall, which houses the Police Department. Overall, the Main Cluster contains one Risk Category 2 facility, six Risk Category 3 facilities, and three Risk Category 4 facilities. The total square footage is approximately 813,000 square feet, and the annual fuel consumption is about 148,000 MMBTU.

The Main Cluster will be served by dedicated "blue sky" electric and thermal distribution, as well as functioning under "black sky" conditions. The Extended Cluster is within the Town Center Microgrid Boundaries and will be served during emergencies by a sectionalized PSE&G grid. In addition to that, a few critical facilities located farther away from Meadowview Complex, including the Meadowlands Hospital and Medical Center and the Secaucus Municipal Utility Authority, could possibly be connected to the microgrid via emergency circuits only.

Main Cluster	Meadowview Complex	595 County Avenue, Secaucus, NJ 07094	414,704	115,983	2,3,4
	Alaris Health at the Fountains	505/595 County Avenue, Secaucus, NJ 07094	209,849	19,893	3
	Secaucus Housing Authority 1	600 County Avenue, Secaucus, NJ 07094	95,000	4,354	3
	Secaucus Housing Authority 2	700 County Avenue, Secaucus, NJ 07094	61,000	4,395	3
	Secaucus Town Hall / Police Station	1203 Paterson Plank Road, Secaucus, NJ 07094	32,451	2,992	4
		Subtotal:	813,004	147,617	
Extended Cluster	Secaucus Fire Station - Engine Company #1	150 Plaza Center Road, Secaucus, NJ 07094	8,061	743	4
	OEM HQ of Secaucus	1377 Paterson Plank Road, Secaucus, NJ 07094	6,990	644	4
	Secaucus Public Library	1379 Paterson Plank Road, Secaucus, NJ 07094	17,765	1,533	3
		Subtotal:	32,816	2,920	
Possible Connection - Emergency Circuit Only	Secaucus Housing Authority 3	777 Fifth Street, Secaucus, NJ 07094	75,000	4,878	3
	Clarendon Elementary School	685 Fifth Street, Secaucus, NJ 07094	84,815	5,835	3
	Meadowlands Hospital and Medical Center	55 Meadowlands Parkway, Secaucus, NJ 07094	196,803	45,481	4
	Mill Creek Mall	3 Mill Creek Dr, Secaucus, NJ 07094	313,659	34,282	3
	Secaucus MUA	1100 Koelle Blvd, Secaucus, NJ 07094	21,794	3,114	3
	Secaucus Recreation Center	1200 Koelle Blvd, Secaucus, NJ 07094	26,000	4,177	3
		Subtotal:	718,071	97,767	
		Total:	1,563,891	248,304	



Critical Class:

II III IV

Main Cluster Critical Class Facilities:
1(II), 6(III), 3(IV)

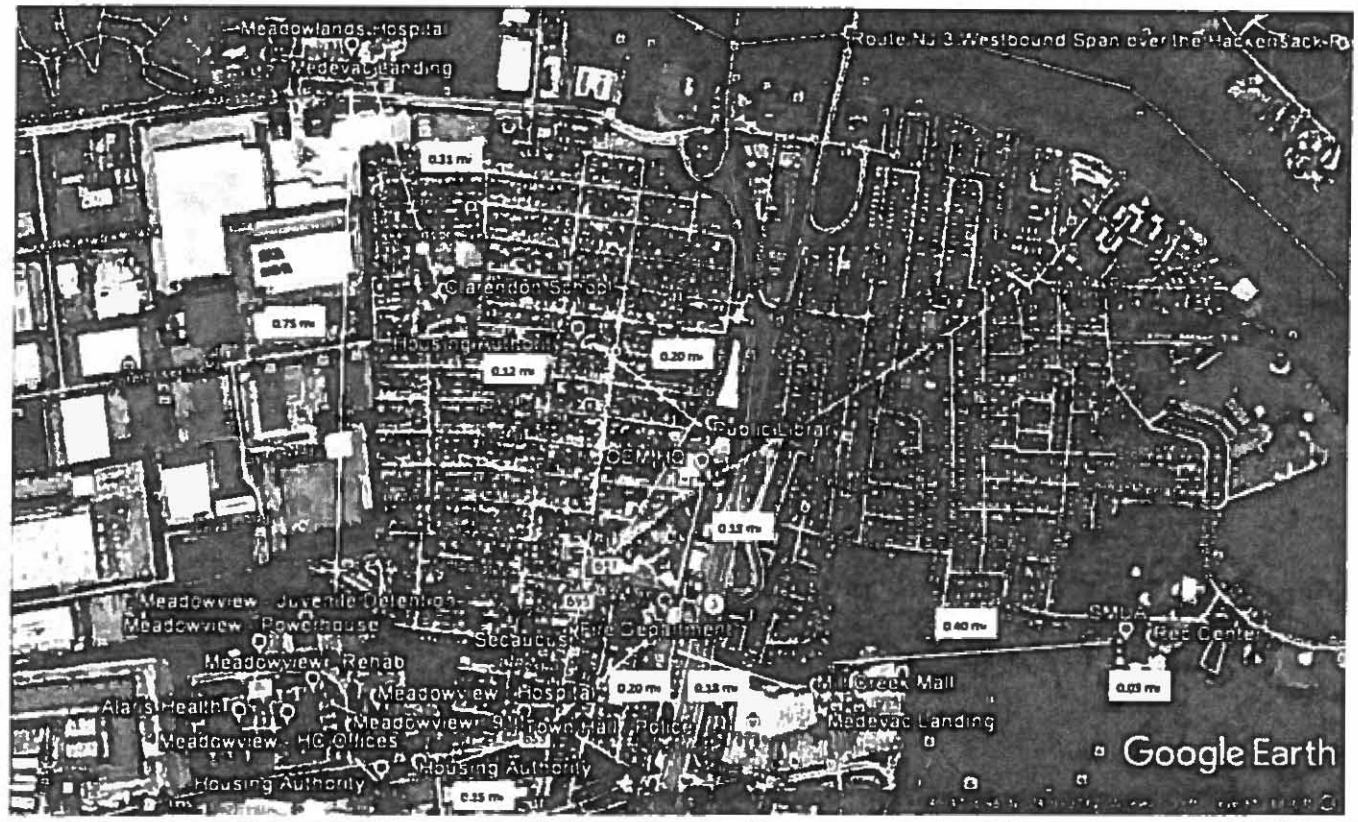
Greener by Design 94 Church Street, Suite #402 New Brunswick, NJ 08901 gbdtoday.com	**Secaucus Microgrid – Main Cluster**	**Hudson County's Town Center Distributed Energy Resource Microgrid Feasibility Study Incentive Application**

Critical Class:

II III IV

Extended Cluster Critical Class Facilities: 1(II), 7(III), 5(IV)

Greener by Design 94 Church Street, Suite #402 New Brunswick, NJ 08901 ghdtoday.com	Secaucus Microgrid – Extended Cluster	Hudson County's Town Center Distributed Energy Resource Microgrid Feasibility Study Incentive Application



Critical Class:

II III IV

Possible Cluster Critical Class Facilities: 1(II), 12(III), 6(IV)

Greener by Design	94 Church Street, Suite #403 New Brunswick, NJ 08901 ghdtoday.com	Secaucus Microgrid – Possible Connection
		Hudson County's Town Center Distributed Energy Resource Microgrid Feasibility Study Incentive Application

3. *Application Screening Prerequisite*

The HCAM was not included in the NJIT Town Center report; however, HCAM satisfies the screening criteria set forth in the NJIT Town Center report.

The selection of facilities and conceptual development criteria were based on a cluster of critical facilities that included the following ranking:

i. Criticality based on the FEMA Category Classification of Facilities.

(1) Class 2, (6) Class 3 and (3) Class 4 facilities were included in our Main Cluster in our preliminary determination for applicability.

ii. Total electric and thermal loads.

The facilities selected represent annual consumption of electric and thermal energy totaling approximately 147,617 MMBTU annually.

iii. A Town Center should have at least 2 Category 3 or 4 facilities within 0.5 miles and a facility with an energy usage of approximately 90 M Btus per square foot.
The Main Cluster contains the Psychiatric Hospital, which is a Risk Category 4 facility, within 0.12 miles of the Hudson County Juvenile Detention Center, which is a Risk Category 3 facility. The Psychiatric Hospital is an inpatient hospital, so according to the 2012 Commercial Buildings Energy Consumption Survey, its consumption is about 231.1 MBtus per square foot.

4. *Potential Partners*

A list of all potential partners to be included in the Town Center DER microgrid MOU.

The HCAM potential partners include:

- *County of Hudson (Lead)*
- *Town of Secaucus*
- *Alaris Health at the Fountains*
- *Secaucus Housing Authority*
- *Secaucus Fire Station – Engine Company #1*
- *Secaucus Public Library*
- *Secaucus Public Schools*
- *Meadowlands Hospital and Medical Center*

- *Mill Creek Mall*
- *Secaucus MUA*
- *Secaucus Recreation Center*

Partners and Conceptual Contracting Strategies

The project partners of HCAM include Local, School, State and County Government and Public agencies with a long history of collaboration and shared services. The Hudson County administration and elected officials play an active role in nurturing the County's relationship with regional private Medical, Retail and Service enterprises. Hudson County may establish a local utilities authority to specifically act as the single point of contracting for private and non-profit partnerships. The private partners are expected to work lock-step with the County and other HCAM public partners to develop mutually advantageous and agreeable contracting terms.

5. Applied Technologies

The Hudson County Town Center DER Microgrid will combine multiple distributed resources into a seamless "island-able" system for emergency services during a blackout and for clean, affordable energy during "blue sky" operations. These resources will be optimized during the proposed design effort, but are currently expected to include:

- New CHP to provide power and thermal energy to existing and planned additional loads within the core Meadowview Complex.
- Up-fit capacity of existing back-up generation at the critical facilities, with modern Tier IV engines reconfigured to run as peaking resources in island mode and demand response resources in "blue sky" mode.
- New PV installations on large flat roofs within the microgrid area, supplemented as needed by the potential ~200 kW parking canopies.
- Modest amount of battery storage, sited at the Meadowview Complex and Housing Authority to serve multiple roles including uninterrupted power during back-up generator start-up, enhanced power quality for sensitive medical equipment, ancillary services to increase the stability and efficiency of the PSE&G local distribution system, ramp-rate leveling for PV output, and additional load-following flexibility during islanded operations.
- In subsequent stages, wind resources may also be investigated, including building-integrated wind on the tallest of the hospital buildings.

The full build-out of the HCAM as described above requires capital investments in the range of $20 million to $50 million. Fortunately, most of that investment will pay for itself, and can be implemented incrementally over time.

Ideally, Hudson County will successfully implement a "utility authority," which will be in-but-not-of the County. Such an arrangement could maximize the benefits for all stakeholders, enabling outside financing, the bonding capacity of an independent authority, competitive contracting for 3rd party construction and operations, and both oversight and credit support from the County and possibly the County's Improvement Authority. A single entity working with 3rd-party implementation partners will also facilitate earning any relevant tax incentives, including the Investment Tax Credit (ITC) and accelerated depreciation. The municipality also has the ability to create a commercial-only PACE financing program, an additional financing tool that has been successful in other jurisdictions (such as Washington DC), and which is already authorized under P.L.2011, c.187 (C.40:56-1.4 et al.).

The bulk of the microgrid's capital resources will derive from each individual element's ability to achieve its own financing independently, with those elements brought together incrementally to form the full microgrid capability. In particular, extensive rooftop and parking-canopy PV installations throughout the area and a CHP system based at the medical complex can both achieve attractive financial returns simply from their own energy revenues, and should be the easiest elements to implement quickly.

Solar: Multiple megawatts of rooftop and parking-canopy PV can be installed under standard PPA arrangements to secure 3rd-party financing. The PPA price should be set at or below market rates for electricity, with SRECs, the ITC, and MACRS providing the economic wherewithal for the end-users to save money without any upfront cost – especially if the projects move quickly enough for bonus depreciation before that provision expires in 2019. A Phase-1 Solar feasibility study was performed at Meadowview Complex and 200 kW was identified as practically and economically feasible.

Canopy A & B

Report

Project Name	Hudson Meadowview
Project Description	Meadowview Campus PV
Project Address	595 County Avenue Secaucus, NJ
Prepared By	Tom Brys tom@tb-tech.net

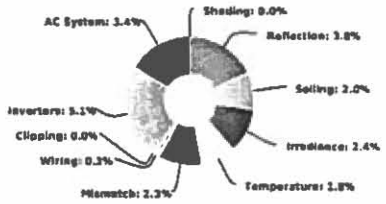
System Metrics

Design	Canopy A & B
Module DC Nameplate	229.6 kW
Inverter AC Nameplate	200.0 kW Load Ratio: 1.15
Annual Production	281.5 MWh
Performance Ratio	81.4%
kWh/kWp	1,225.9
Weather Dataset	TMY, 10km grid (40.75, -74.05), NREL (prospector)
Simulator Version	def301cbef-e8897ed29a-940c5581e2-6256e2eb98

Project Location

Monthly Production

Sources of System Loss



Annual Production

Description		Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,450.9	
	POA Irradiance	1,505.4	3.8%
	Shaded Irradiance	1,505.2	0.0%
	Irradiance after Reflection	1,448.5	-3.8%
	Irradiance after Soiling	1,419.5	-2.0%
	Total Collector Irradiance	**1,419.5**	**0.0%**
Energy (kWh)	Nameplate	329,390.3	
	Output at Irradiance Levels	321,506.1	-2.4%
	Output at Cell Temperature Derate	315,580.3	-1.8%
	Output After Mismatch	308,269.7	-2.3%
	Optimal DC Output	307,275.3	-0.3%
	Constrained DC Output	307,225.7	-0.0%
	Inverter Output	291,523.0	-5.1%
	Energy to Grid	**281,466.0**	**-3.4%**
Temperature Metrics			
	Avg. Operating Ambient Temp		14.4 °C
	Avg. Operating Cell Temp		21.4 °C
Simulation Metrics			
	Operating Hours		4683
	Solved Hours		4683

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km grid (40.75, -74.05), NREL (prospector)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model
Temperature Model Parameters	Rack Type: a: 3.56, b: 0.075, Temperature Delta: 3°C Flush Mount: a: -2.81, b: -0.0455, Temperature Delta: 0°C
Soiling (%)	J: 2, F: 2, M: 2, A: 2, M: 2, J: 2, J: 2, A: 2, S: 2, O: 2, N: 2, D: 2
Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%
Module Characterizations	Module: Sunmodule Protect SW 280 (SolarWorld); Characterization: Default Characterization, PAN
Component Characterizations	Device: PVI CENTRAL 100 US (480V) (ABB (Power One)); Characterization: CEC 2014 08 16

Greener by Design

Annual Production Report

Components

Component	Name	Count
Inverters	PVI CENTRAL-100 US (480V) (ABB (Power One))	2 (200.0 kW)
AC Panels	2 input AC Panel	1
AC Home Runs	1/0 AWG (Aluminum)	2 (432.6 ft)
AC Home Runs	350 MCM (Copper)	1 (4,273.1 ft)
Home Runs	500 MCM (Copper)	4 (574.1 ft)
Home Runs	1/0 AWG (Aluminum)	8 (405.6 ft)
Combiners	2 input Combiner	4
Combiners	7 input Combiner	4
Combiners	9 input Combiner	2
Combiners	10 input Combiner	2
Strings	10 AWG (Copper)	66 (4,191.5 ft)
Modules	SolarWorld Sunmodule Protect SW 280 (280W)	820 (229.6 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	11-13	Along Racking

Field Segments

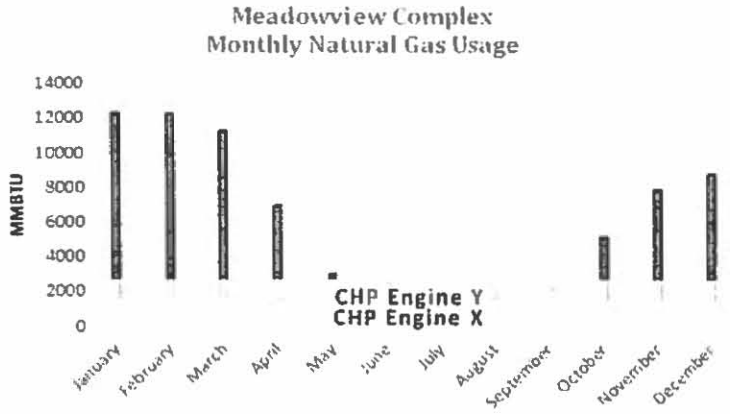
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Vertical (Portrait)	15°	112.873665190626 64°	0.0 ft	4x1	135	540	151.2 kW
Field Segment 2	Carport	Vertical (Portrait)	15°	112.874°	0.0 ft	4x1	70	280	78.4 kW

Detailed Layout

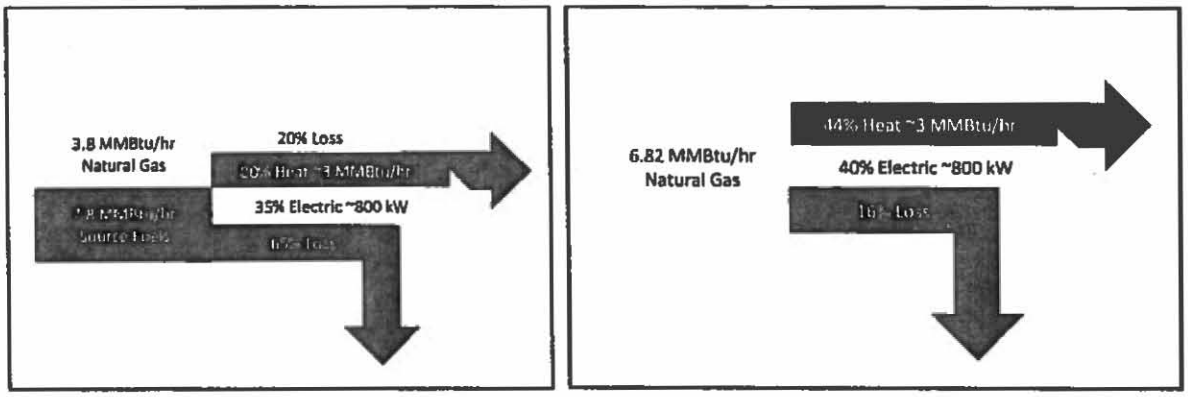
The solar installations will operate and pay back their investment, independent of other microgrid components.

Storage: *Islandability* for the microgrid will be significantly enhanced by the addition of modest amounts of battery storage, which can provide an uninterrupted power bridge for the hospital complex during back-up generator start-up, can handle rapid load variations during islanded operations, and can compensate for cloud-cover events that create rapid ramping of the PV output, either up or down. Current incentive programs, including the Renewable Electric Storage incentive of $300/kWh, recognize these essential roles and will help cover capital costs. At least as important, during "blue sky" operations, batteries provide value by enhancing power quality for sensitive medical equipment (in some cases reducing the need for stand-alone UPS systems). They also enable the high levels of solar saturation envisioned for the Town Center properties, by helping the existing distribution system accommodate such a large percentage of integrated PV assets. Finally, storage assets can earn everyday revenues by providing ancillary services that increase the stability and efficiency of the PSE&G local distribution system, leveling ramp-rates for PV output, and participating in existing markets such as frequency regulation and demand response. As such tariffs and markets continue to develop, those projected revenues should increase. With a combination of incentives for islanded operations, and concrete delivered value plus market-based revenues for "blue sky" operations, the batteries should pay for themselves with an acceptable payback.

CHP: Combined Heat and Power (CHP) has been identified as a probable candidate for implementation with high potential as the complex utilization is planned to increase. The central boiler heating plant serving the Meadowview Complex is uniquely configured with existing underground tunnels and delivery infrastructure from the Powerhouse to the other buildings throughout the complex.



The logistical advantages of distribution and utility interconnectivity, as well as additional central electric, steam, domestic hot water and potential future chilled water loops, present opportunities worth prioritizing for additional analysis and evaluation.



Existing Central Plant Cycle (baseload) ***Conceptual* Central CHP Cycle (baseload)**

Distribution System: Integration of sources and loads requires additional pipes and wires, whose cost will be reduced by focusing distribution connections only on the Main Cluster for "blue sky" operations. That cost will be further reduced by the pre-existing tunnels connecting the buildings of the Meadowview Complex. By sharing in the electric and thermal output from the CHP system, the distribution system investment should be recoverable via lower energy and O&M costs, with a 7 to 10-year payback.

Controls: The Meadowview Complex is currently in the procurement phase for the Energy Savings Improvement Program (ESIP) which will include a Complex-wide open architecture advanced computer based Building Automation System (BAS). The BAS will include energy monitoring and metering at each facility within the Meadowview Complex with network and hardware expansion to accommodate acting as the "main hub" for facility-based digital information to assist with the overall management of the Microgrid.

Islanding: The final element to create the Town Center microgrid is the sectionalized distribution system that will provide power to the full suite of essential services identified in the Extended Cluster. In view of the benefits provided to a broad cross section of Hudson County's residents, and the essential services provided by the fire department, OEM Headquarters, and the Public Library to the surrounding region, we believe the grid-upgrade costs should be approved for rate-basing by PSE&G. Under this approach, the PSE&G-owned distribution system would provide the core connectivity to reach the additional islanded loads during an outage. Since that function would not be utilized during "blue sky" operations, the rate-based capital costs should not be

constrained by standard rate-recovery. Part of the benefit of this pilot program is to work with the BPU and the utility to identify the preferred arrangements that will mitigate any incompatibilities with existing tariffs.

In sum, a layered and modular financing approach pairs up with the diverse stack of microgrid benefits and with the ability to incrementally implement the individual microgrid components.

6. Cost and Potential Financing

Fortunately, the microgrid also provides a long list of additional benefits. The new generation and improved operational efficiencies both create concrete value, with associated revenue streams, meaning that most elements of the microgrid pay for themselves, thus minimizing the capital cost associated with achieving the desired resiliency and emergency response capabilities. These "blue sky" benefits and value streams include:

- The kWh output from the solar panels, monetized as avoided electricity bills, net-metering, and power exports.
- The zero emissions from solar power, monetized as SRECs and other incentives.
- The kWh output from the future CHP facilities at the medical complex, monetized as avoided electricity bills and power exports.
- The recycled waste heat from the CHP facilities, monetized as avoided heating and cooling bills and the avoided costs of operating, maintaining and then replacing aging boilers and chillers.
- The lower emissions from the use of recycled waste heat for heating and cooling, currently poorly monetized.
- The avoided or deferred investment in transmission and/or distribution system equipment to serve Hudson County's critical operations and surrounding communities, since a significant fraction of the load (including peak loads) will be met by local resources, currently monetized through BPU-authorized incentives for CHP and microgrids and potentially through future capacity-like markets for DER.
- The avoided costs of providing ancillary services and peak reduction through the microgrid's combination of resources, load control, and storage, instead of relying other more expensive or less efficient means, somewhat monetized through existing PJM and PSE&G programs and markets, hopefully receiving more robust compensation as those mechanisms continue to develop.
- The avoided costs of equipment malfunctions and failures due to poor power quality, especially for sensitive medical equipment but also for computers, electronics, and electric motors (such as elevators), poorly monetized except when avoiding the expense

of stand-alone UPS systems.

- The real-options value of the physical components of the microgrid, enabling future investment flexibility in the face of the evolution of energy markets and energy-system performance.
- The real-options value of the operational capabilities of the microgrid, enabling minute-to-minute flexibility in the production and procurement of electricity and thermal energy.

These every day and every-minute benefits, especially those with full monetary compensation for value delivered, are the backbone for the vast majority of the required microgrid investment. The resiliency and emergency response benefits described above will outweigh any remaining capital cost contribution needed to achieve full "island-ability" for the complete set of critical loads and functions within the boundaries of the microgrid.

7. Benefits

- Economic benefits: Revenue markets for ancillary services, demand response, EE, capacity, or energy markets
- Environmental benefits: renewable energy, enhanced underground conduits, lower emissions, compliance with EPA and DEP emissions standards at the Powerhouse and high energy consumption facilities
- Resiliency benefits: communication hub, policing and security for the region, enhancement of PSE&G's administrative offices
- Previous microgrid modeling efforts: none to date except participation in Hoboken's Resilient Microgrid Study with US DOE and Sandia National Labs

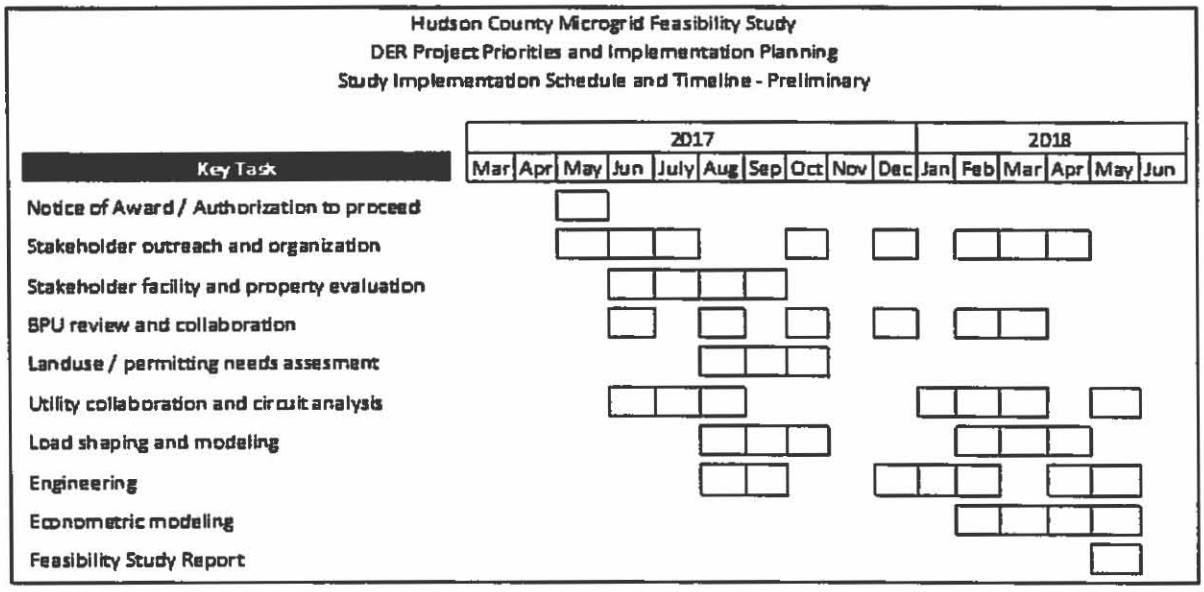
The central benefit of the HCAM is to keep essential services up and running regardless of the impact of storms, black-outs, heat-waves, cyber-threats, or other potential grid disruptions. Hospitals, fire and police, emergency communications, heliport, evacuation shelters etc., must all have resilient and reliable power in order to serve the local region.

8. *Utility Interconnectivity, Distribution System Safety and Communications*

The HCAM resources will be dispatched and coordinated through a central microgrid controller, located adjoining the Meadowview Complex's central heating plant, which will also provide real-time communication with PSE&G data systems and with PJM ancillary services and demand-response markets. The medium-voltage service to the Meadowview Complex will serve as the Point of Common Coupling to main grid for islanded operations; any other service connections for the microgrid loads will be sectionalized to prevent any undesired back-feed onto utility lines. The full-time operators of Meadowview Complex's existing steam systems will be trained to provide on-site supervision of the fully automated microgrid controller, with additional oversight from a contractor's 24-hr remote operations center.

9. *Time Frame for the completion of the feasibility study*

The study is expected to be completed in 12-months.



10. Modeling

The team will use the HOMER Pro Microgrid software, which specializes in Microgrid design and allows for the simulation modeling, map making, analysis, and more. Both CHA and GI Energy have experience using HOMER Pro and will use their own proprietary tools as well in addition to any relevant tools such as Rutgers' Center for Energy, Economics and Environmental Policy cost/benefit analysis (CBA) model and the GbD Resilient Microgrid Toolkit (RMG).

Using lessons learned during our work on prior Microgrid studies, we evaluate design options for both off-grid and grid-connected power systems for remote, stand-alone, and distributed generation applications using HOMER Pro. HOMER Pro is a computer model that simplifies the task of evaluating design options for both off-grid and grid-connected power systems for remote, stand-alone, and distributed generation (DG) applications. HOMER Pro's optimization and sensitivity analysis algorithms allow the user to evaluate the economic and technical feasibility of a large number of technology options and to account for uncertainty in technology costs, energy resource availability, and other variables.

The HOMER Hybrid Optimization Modeling Software is used for designing and analyzing hybrid power systems, which contain a mix of conventional generators, cogeneration, wind turbines, solar photovoltaics, hydropower, batteries, fuel cells, hydropower, biomass and other inputs. The tool can analyze either grid tied or standalone systems and can also perform greenhouse gas calculations for the measures being considered. HOMER allows out team to input an hourly power consumption profile and match renewable energy generation to the required load. We analyze microgrid potential, peak renewables penetration, ratio of renewable sources to total energy, and grid stability, particularly for medium to large scale projects. Additionally, HOMER contains a powerful optimizing function that is useful in determining the cost of various energy project scenarios. This functionality allows for minimization of cost and optimization of scenarios based on various factors (e.g., CO2 minimization). To meet the renewable energy industry's system analysis and optimization needs, NREL started developing HOMER in 1993. NREL retains ownership of the licensed software, and retains the right to use HOMER on government projects. In addition, users will always be able to download version 2.68 Beta free of charge from HOMER Energy. [1]

Our team of Certified Energy Managers, Professional Engineers and Microgrid specialists have developed proprietary specialized modeling to compliment HOMER Pro's capabilities to accommodate real-time challenges and innovative application techniques.

11. *Requested Funding Amount*

In recognition of the resources required, time to collect detailed information and to cultivate public and private partners and stakeholder, HCAM is requesting $150,000 to adequately fund necessary technical planning and analysis.

12. *Cost share by Lead Government Entity or any of the stakeholder partners*

The County intends to provide the following cost share amounts:

In-kind staff time of microgrid stakeholder group: approximately 300 hours

The County have obtained quotes and intends to install generators for offices at Meadowview which total approximately: $892,248.00

The County intends to invest capital for the construction upgrades and renovation of the Meadowview Complex County archives building for the County Prosecutor Office and a renovation project of the Juvenile Detention Center for a Police Training Academy.

The County intends to participate in the Energy Savings Improvement Program upon approval by early April. The facilities will include the Meadowview Complex and the Hudson County Correctional Center.

13. ***A listing of all Consultants as prime or subs that will perform work on the feasibility study and the level of expertise in this area of microgrid development***

The HCAM team led by Hudson County and the Hudson County Improvement Authority will work closely with their consultant for environmental asset management, Greener by Design LLC. Greener by Design (GbD) will assist Hudson County with the project management of the feasibility study. Greener by Design has sub-contracted with GI Energy and CHA to complete the feasibility study. The following are the prospective roles for the prime consultant and subs.

Greener by Design (Prime)

- Stakeholder engagement
- Planning and Mapping Requirements
- Outreach and Support to various elected, appointed, utility or regulatory officials
- Various permitting, land use, air quality and other potential MicroGrid development issues
- Planning for the necessary implementing authorities (Utility Authority)
- Utilize the Resilient Microgrids Toolkit to conduct cost/benefit analysis
- Prepare regulatory and financial guidance

GI Energy (Sub)

- Creation of technical support documents
- Distribution system and Energy Supply Modeling
- Review of various power production and power conservation options
- Financial reviews and various technical and financial feasibility analysis
- Conduct assessment through the Rutgers' DER Cost Benefit analysis model

CHA (Sub)

- Energy Master Planning & Engineering – Procurement, Efficiency, Generation, Security and Technology
- Legal – Land Use, Ownership & Configuration, Optimal Return, Utility Support
- Community Outreach – Consensus Building, Public Relations, Implementation Process

Distributed Generation and MicroGrid Development

Greener by Design (GbD) provides a comprehensive energy investment and environmental management platform that allows our multidisciplinary team of technical, financial, energy management, and environmental planning professionals to bring a thorough understanding of the still complex world of DG and MicroGrid development.

Greener by Design is uniquely qualified to assist in microgrid projects based on both its experience and relationships with the various utilities and state and federal regulators (NJ BPU, FERC, PJM, and Rate Counsel) that will be essential to a project's success. Working with experts from across the United States including Sandia National Lab, the Rocky Mountain Institute, the U.S. Department of Energy, and a host of utilities, regulators and universities, Greener by Design was engaged by a variety of public and private sector clients after Superstorm Sandy to assist in the design, financing and implementation of several MicroGrids from Washington DC to New York. Walter Reed Hospital, John Hopkins University / EBDI, Staten Island EDC, Cities of Hoboken, Seaside Heights, Woodbridge and a host of private sector portfolios began the process of designing 'islandable' systems that recognized the need for both emergency power and economic viability of a MicroGrid.

GbD has developed a unique understanding of the complexities that surround the evolving world of energy deregulation and market dynamics that make DG or MicroGrid's economically viable. This expertise extends to related emerging technologies such as vehicle-to-infrastructure and "virtual pipelines".

This comprehensive experience, combined with ongoing work with a host of federal, state and not for profit entities developing MicroGrids throughout the United States makes GbD unique among other firms. Our background in energy, environment, regulatory and utility work in the United States is unmatched.

Select Energy DG and MicroGrid Case Studies

CITY OF HOBOKEN, NJ

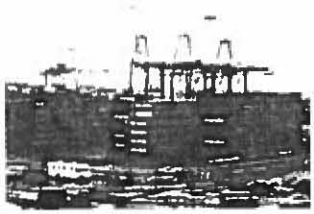
GbD was retained by Hoboken days after Hurricane Sandy devastated the infrastructure of the City.

- Working with our partners at Sandia National Labs, PSE&G, the City of Hoboken and the NJ BPU, GbD helped to create the concept paper for the development of the nation's first community scale MicroGrid.
- GbD was given full responsibility for the planning, regulatory, financial and operating construct of the project. As the only private firm in New Jersey to work with the stakeholders involved in this project, GbD developed a unique understanding of the challenges and opportunities a community based MicroGrid can bring and helped turn that into a tool kit for MicroGrid planning and design.
- This ongoing work has been nationally recognized for its innovative approach and for the cooperative agreements established between the various stakeholders, including the utility and regulatory community.

WALTER REED HOSPITAL AND EASTERN BALTIMORE REDEVELOPMENT, WASHINGTON DC & BALTIMORE, MD

These unique Northeast Corridor projects represent some of the highest profile redevelopment projects in the US looking at using DG and MicroGrid design as part of a comprehensive redevelopment planning effort.

- GbD worked with a variety of public and private stakeholders including the US Army, PJM, John Hopkins University, Forrest City, the PUC and various State regulators to develop the blue print for distributed energy as these two critical sites.
- Geothermal, CHP, Solar with storage were all analyzed as part of the creation of an energy master plan for both sites.
- GbD developed a variety of regulatory and incentive strategies that were used in the final master plans.
- Currently, both sites are in construction or final planning and are expected to be completed over the next several years.



MAHER TERMINALS, ELIZABETH, NJ

Working with Maher Terminals, the largest container terminal on the East Coast, GbD conducted a comprehensive analysis of energy use and environmental impacts from operations at this large intermodal facility.

- Worked with US EPA, NJ DEP to complete comprehensive audit of Maher's various consent orders, fines and other enforcement actions related to the operations of the facility.
- Developed Energy and Operations Master Plan aimed at reducing emissions and energy use for regulatory compliance and ROI.
- Implemented ECMs and facility wide upgrades on a variety of equipment including electric cranes, hybrid straddle and other equipment and installation of roof top solar, building controls and a various demand response and load shedding assets.
- Currently conducting MicroGrid study for the islanding and operations of the facility during emergent times. This 5 MW project will also include homeland security, cargo container monitoring and logistic operation amongst the other more standard functions of the MicroGrid.

WOODBRIDGE TOWNSHIP, NJ - Community Based MicroGrid Development
GbD has been assisting Woodbridge Township for the last 8 years and has been recognized as the leader in sustainable development by the New Jersey League of Municipalities for each of those years.

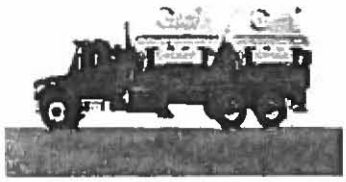
- Working with the Township, GbD successfully obtained grant money for the development of a MicroGrid Feasibility Study. This study identified and ranked critical facilities and provided information on flood plain, traffic circulation and land use issues critical for emergency response.
- Presentations to stakeholders, utility data gathering, cost benefit analysis, partnership development and management and control of the MicroGrid were developed for final funding requests to the NJ BPU.
- GbD has management oversight of Woodbridge's Local Government Energy Audit program and implementation of recommended energy efficiency retrofits and renewable energy installations on municipal buildings. This also includes the preparation of Energy Efficiency and Conservation Strategy (EECS), Carbon Footprint Analysis, and Climate Action Plan.
- Sustainable Jersey Award Recipient (2009-2015)

HUDSON COUNTY IMPROVEMENT AUTHORITY, JERSEY CITY, NJ
GbD is assisting the Hudson County Improvement Authority in a wide range of Energy Planning and funding activities including master planning for demand response and energy resiliency.

- Beginning with an outline of each facility, age, infrastructure, use and future use, GbD developed a procurement and energy efficiency strategy to create a true baseline of energy costs and consumption.
- Upon completion of the audits and reducing the overall energy commodity cost, GbD developed a cost benefit analysis for the implementation of the various ECM's identified.
- In addition, GbD analyzed the various opportunities for demand response.
- Working with EPA and NJ DEP, HCIA developed a spec for all generators that would allow for running on non-attainment days.
- Hudson County is in the process of installing those generators as part of their overall Energy Master Plan that will allow critical facilities to island themselves in times of emergency.

GBD MICROGRID EDUCATION AND SPEAKING
GbD is a policy leader in MicroGrid development and design. GbD has participated as an invited guest, in top think tanks and public and private sector programs on MicroGrid development including:

- **ROCKY MOUNTAIN INSTITUTE**
  Invited to participate with the City of Hoboken Sundance, Utah for the e-Lab Accelerator on the development and implementations of the future of microgrids. Other members of our team were from Concord Engineering, NJ-BPU, PSE&G, and the City of Hoboken.
- **THE PEW CLEAN ENERGY INITIATIVE**
  Featured in The PEW Clean Energy Initiative video, "How Microgrids Improve Resiliency in Power Outages", to view go to:
  https://www.youtube.com/watch?feature=player_embedded&v=X5RI7HhPskI
- **TED TALK**
  Adam Zellner, GbD President, featured at TEDxHoboken: "Is your cell phone charged? America's addiction to energy.



VEHICLE TO GRID – EMERGENCY FUEL

MOBILE FUEL SOLUTIONS, Natural Gas Virtual Pipeline

- GbD is providing a full slate of regulatory and business development consulting to Mobile Fueling Solutions (MFS).
- In addition to serving locally based public and private fleet customers, MFS's Virtual Pipeline© uniquely allows compressed natural gas stations to serve geographically dispersed industrial, commercial or fleet customers without the need to develop additional costly pipeline or other infrastructure, effectively turning existing stations into super-regional fueling center.
- MFS delivers CNG to customer locations in modular containers transported on specially designed. This transport capability also provides resilient emergency services in that it provides backup to other natural gas users in the event of a supply disruption.

Initiative for Resiliency in Energy Through Vehicles, National Association of State Energy Officials

- Under contract to the non-profit NJ Clean Cities Coalition, GbD is an integral partner in this national effort to catalyze state and local acceptance and deployment of alternative fuel vehicles and infrastructure in preparing for and responding to man-made and natural disasters and emergency situations.
- In support of NASEO's transportation program and resiliency planning efforts, GbD staff serves as national strategic advisor and as the NJ lead, and participate on the national Steering Committee for the development and dissemination of information to support state and local decision making regarding the use of alternative fuels in emergency response and preparedness operations.

GAIL LALLA
Vice President of Operations

Greener by Design

Overview and Areas of Expertise
Gail Lalla is Vice President of Operations and uses her expertise in budgeting, planning, communication skills and team motivation to keep each client project on track for timely and efficient results. When she was GbD's Senior Project Manager, she navigated the myriad of incentives available, investigated current policy changes, and vetted data collection for several redevelopment projects. She has notably added a marketing division of GbD, in which she has assisted clients such as Sports Art with a full launch of their energy efficient and sustainable product line for fitness equipment, Eco-POWR. She has successfully led efforts focusing on carbon abatement plans, Energy Saving Improvement Plans with ESCOs, resiliency planning with the Kresge Foundation, and microgrid strategy with Rocky Mountain Institute.

Her areas of expertise include:

- Project Management and Performance Optimization
- Project Financing
- Formulation of Multi-stakeholder Ownership/Investment Structures and Strategies for for-profit and non-profit companies
- Clean Energy policies and waste management market research
- Grants administration
- Local, state, and federal incentive identification
- Special Improvement District Management

Education
B.A., Political Science, Rutgers University, 2010
Spanish Immersion Program, Universidad de Salamanca, Spain, 2009.

Activities
Sustainable Jersey at TCNJ, Member of the Arts and Creative Culture Task Force
Caribbean Diaspora for Science, Technology & Innovation – NY-NJ Chapter, Branch Leader, 2013-Present
The Work of Art Dance Theater, Executive Director, Grant Coordinator, Company Member, 2010-Present.
Community Service Chair, Society of Hispanic Engineers, 2007-2008.

Representative Project Experience

Project Management, Economic and Financial Analysis, Grants Coordination

- Provide strategic services for both client management and operations at Greener by Design while assessing the potential growth for clientele by analyzing their holdings.
- Maintain and apply a comprehensive database of grants and loans to aid with funding plans for clients and perform regulatory and market analysis
- Provide development consulting services to public, non-profit and private for profit clients.
- Prepare applications for opportunities for redevelopment and job creation, utilizing local, state, federal incentives including New Market Tax Credits, Economic Redevelopment and Growth and NJ GROW incentives offered by the EDA
- Forge partnerships within local business communities to allow for revitalization via economic feasibility studies, Special Improvement District (SID) creation, SID management, economic revitalization plans, and economic development corporations
- Develop, coordinate, and deliver various presentations and memos for speaking engagements about economic development and environmental asset management for conferences in Binzhou, China, Orlando, Florida, Las Vegas, Nevada and in the tri-state area.

Community Engagement, Sustainability Planning and Regulatory Policy Support

- Sports Art. Lead the marketing and sustainability planning for best-in-class line of energy harnessing fitness equipment, ECO-Powr. Developed white paper for attracting clientele in North America. Achieve first green/energy efficiency certification for fitness equipment. Create a Corporate Social Responsibility platform for their global headquarters. Create non-traditional partnerships with eco-friendly companies.
- Bijou Developers. Serve as expeditor for construction management team. Secured $1,229,244.81 for clean energy projects.
- *Staten Island Economic Development Corporation. Serve as Project Manager for revitalization study for NY Department of State's Brownfield Opportunity Area grant for 178-acre industrial business district. Implemented creative stakeholder strategy for engaging public and private entities to give critical feedback for development.*
- *Maher Terminals.* Serves as Project Manager and Governmental Consultant for energy use and environmental impact analysis at this intermodal facility. Project includes technical and financial analyses, solar feasibility and implementation, sustainable/energy efficiency building audits, fuel switching plan for equipment and fleet, and energy policy advisement for myriad other tasks.

Supplementary Project Experience

- Director of Marketing for Uptown Linden Inc, a Special Improvement District that supports about 200 merchants. Create comprehensive marketing and management plan for the district. Assist in the recruitment of new businesses. Produce strategic events that encourage for economic development.
- Worked with **Congressman Frank Pallone Jr. Constituent Office in** New Brunswick, NJ. Resolved federal issues regarding immigration, veteran's affairs, and social security benefits.

CHUCK FEINBERG, EXECUTIVE VICE PRESIDENT
Alternative Fuels and Advanced Vehicle Expert

Greener by Design

Overview and Areas of Expertise

Mr. Feinberg is the Executive Vice President of GbD and has an extensive history in a broad spectrum of engineering, energy environmental and construction projects including government service, technical and risk management, and financial and insurance services. Within his portfolio of projects, Mr. Feinberg has successfully managed all aspects, including operations, business development, financial planning, technical consulting, contract administration, and staff development. He has a proven track record of building new business, closing deals, effectively managing staff and delivering quality products and services on-time and within budget, having held senior management positions in North America's largest engineering, infrastructure, and environmental consulting organizations, as well as more recently with his own consulting practice and as Chairman of a non-profit organization. His areas of expertise include:

- Technology evaluation
- Grant, proposal and financing application preparation
- Program & project development and management
- Operations planning and implementation
- Management systems development & evaluation

Education

Tufts University, B.S.E., Civil Engineering/Engineering Management, 1980
New York Law School, Admitted to the Bar, New York/New Jersey, J.D., 1988

Service

- Chairman, NJ Clean Cities Coalition, A Non-profit Corporation
- Board of Trustees of Transportation Energy Partners
- Rockaway Township Environmental Commission
- Environmental Business Council of the NJ Commerce & Industry Association (co-founder)
- Environmental Business Association of NYS, Sustainable Business Task Force

Honors

NGV America's 2012 NGV Advocate-Ally Award for outstanding contributions to the advancement of natural gas as a vehicle fuel.

Representative Project Experience

Sustainability Planning, MAHER TERMINALS Corporate Campuses in Port Newark, NJ & Prince Rupert, Canada. Mr. Feinberg serves as project manager for the development of a comprehensive Sustainability Plan and performance of an analysis of energy use and environmental impacts from operations at these large intermodal facilities. GbD is currently implementing the Plan by performing:

- Technical and financial feasibility assessments for roof-top solar installations.
- Sustainability/energy audit services for buildings on site.
- Alternative fuels analysis for a large fleet of specialized vehicles used to move containers at the nation's busiest ports.
- Sustainability Master Planning and NJDEP Environmental Stewardship

NJ CNG Fleet and Infrastructure Development Project. Mr. Feinberg led the proposal effort and is now managing and providing technical expertise on a 4 year program to accelerate the transition of private and municipal fleets to CNG. His project team effectively leveraged a $15 million U.S. Department of Energy investment with an additional $32 million non-federal investment to transition more than 300 garbage trucks and shuttle buses belonging to 15 fleets and the construction of six new CNG stations across New Jersey. This project will directly displace 2 million gallons of petroleum and avoid almost 1 million lbs. of criteria pollutants per year.

New Jersey Clean Cities Coalition. Mr. Feinberg is Chairman of the Board of this independent 501c3 nonprofit entity which is dedicated to the advancement of alternative transportation fuels to increase our environmental, energy and economic security. He has extensive industry contacts and is a recognized expert and frequent speaker on petroleum reduction topics including natural gas (CNG & LNG), biodiesel, ethanol, hydrogen, propane, idle reduction and others.

New Jersey Department of Environmental Protection, Electric Vehicle Policy Support. Under a Purchase Order issued by the NJDEP, Mr. Feinberg developed a report entitled "A Comprehensive Plan for An Electric Vehicle Infrastructure". As part of the effort he also facilitated a state interagency task force.

Picatinny Arsenal, NJ, Environmental Compliance Services. Under a series of Delivery Orders spanning five years, Mr. Feinberg provided planning and execution technical assistance involving federal, state and DOD requirements at this armament research, development and former production facility. He served as Chair of the Installation's Hazardous Material Management Team, which was a cross-functional, interdisciplinary group chartered to develop and implement revised HM/HW management practices. This team won the **Commander's Award** as the most effective team on the Arsenal.

EPA Program Support, U.S. EPA Region 2. Program Manager of a 5 year, $30 million contract; provided the leadership necessary for the planning and successful execution of more than 175 work assignments; provided overall technical direction and technical review on more than 1000 multimedia evaluation audits. His multidisciplinary teams also provided comprehensive technical services related to the design and construction of site cleanups at hazardous and toxic waste sites and RCRA regulated facilities.

Army Corps of Engineers. Over 9 years, promoted from entry-level (GS-5) field engineer/construction manager in New York District, to Chief of the Environmental Programs Section of the North Atlantic Division (GM-14). The multidisciplinary office he supervised was responsible for the EPA Construction Grants Program, the Defense Environmental Restoration and Superfund programs throughout the Northeast.

THOMAS BRYS, CEP, CEM, CDSM, CSDP

Energy Engineer

Greener by Design

Overview and Areas of Expertise

Tom Brys has 20 years of diverse experience in the identification, development and implementation of energy management technology projects. In addition, Mr. Brys has served hundreds of clients ranging from municipal energy aggregations and cooperatives to large Fortune 100 Pharmaceutical companies. Mr. Brys has managed and authored multiple Sustainable Energy Master Plans and has provided technical consulting for over 300 Mega-watts of photovoltaic projects in New Jersey and Pennsylvania. Mr. Brys serves as past president of the New Jersey Association of Energy Engineer and currently serves on the Board of Directors.

Education

B.A. Business Administration, Middlesex County College / Canterbury University

Professional Registrations and Certifications

- CEP–Certified Energy Procurement Professional
- CEM – Certified Energy Manager
- CDSM – Certified Demand Side Management Professional
- CSDP – Certified Sustainable Development Professional
- IQ/OQ/PQ Validation Training for Pharmaceutical Applications
- Technical Writing
- High Performance Team Building for Project Managers
- Geothermal Technology II

Professional Affiliations

- Board of Directors – New Jersey Association of Energy Engineers
- President – New Jersey Association of Energy Engineers (2010 - 2012)
- Chairman – North Brunswick Environmental Commission
- Member – Association of Energy Engineers, National

Representative Experience

Morris County Improvement Authority County Solar Program II

Energy Consultant responsible for evaluating and ranking project development sites. Provided technical review and guidance for the solicitation and selection of the contractor using a competitive RFP. Provided technical oversight for the design, permitting, interconnection and construction of (9) sites totaling 3 MW within Morris County. Managed the inclusion of pre-purchased 1603 Grant Safe Harbored equipment.

Brick Township Landfill Solar Project

Energy Consultant responsible for determining the economic and practical feasibility of implementing a 6MW PV project on a closed landfill using Township financing in a Public Private Partnership through redevelopment. Prepared technical contract documents and provide oversight during design, interconnection and construction.

Brick Township Solar and Wind Project

Energy Consultant responsible for determining the economic and practical feasibility of implementing a .15 MW PV project at the Township Municipal Complex and a 10 Kw wind turbine project at the Drum Point Sports Complex using Township financing and grant funding through a competitive RFP. Prepared technical contract documents and provide oversight during design, interconnection and construction. Performed post-construction performance monitoring and SREC management.

Pocono Raceway Solar Project

Acted as the owner's representative in the development, evaluation and selection of equipment and contractors for the implementation of the Raceway's 3 MW photovoltaic system. Provided post-construction performance monitoring and SREC management.

Woodbridge Township Solar Project

Energy Consultant responsible for determining the economic and practical feasibility of implementing a .85 MW PV project on a (4) Township buildings using Township financing through a competitive RFP. Prepared technical contract documents and provide oversight during design, interconnection and construction. Performed post-construction performance monitoring and SREC management.

Ocean County Sustainable Energy Master Plan

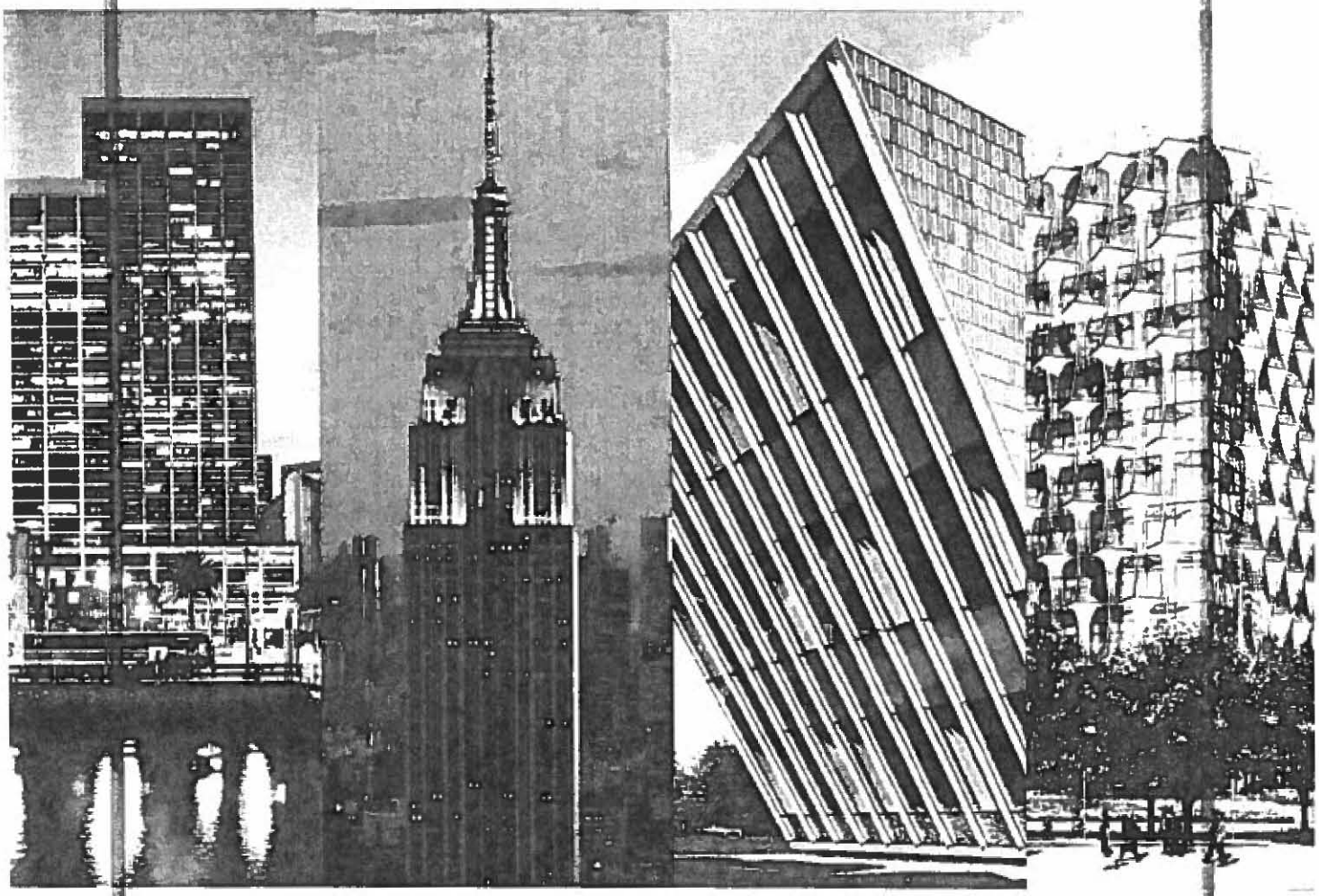
Energy Consultant responsible for preparing a comprehensive plan to document the current status of the County's sustainability and energy management practices and to provide a road map for the County's future activities and projects as they relate to energy procurement, consumption and generation. Fifty percent of the recommendations have been implemented. The project cost was $125,000.

Bergen County Sustainable Energy Master Plan

Energy Consultant responsible for preparing a comprehensive plan to document the current status of the County's sustainability and energy management practices and to provide a road map for the County's future activities and projects as they relate to energy procurement, consumption and generation. Fifty percent of the recommendations have been implemented.

gi energy

Providing Sustainable Energy



- Energy Master Planning
- Engineering & Design
- Financial Structuring
- Construction & Installation
- Energy Data Analytics
- Operations & Maintenance

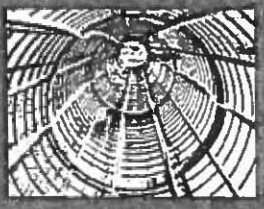
www.gienergyus.com

GI Energy is a leading developer of on-site energy and microgrids. GIE tailors long-term, sustainable and efficient energy solutions for your current and future needs.

Our energy technology expertise

Combined Heat & Power (CHP)

CHP uses natural gas to provide electricity, chilled water and steam. GIE installed the largest CHP system in a New York commerical building.

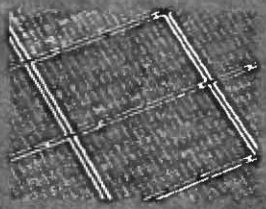


Geothermal and Energy Foundations

Ground source heat pumps use the earth to provide highly efficient heating and cooling. GIE pioneered Energy Piles in 2001 with Skanska and is working on America's largest project to date.

Energy Storage

GIE works with partners like Tesla and NEC to provide affordable and scalable energy storage systems.



Solar

GIE integrates solar with other technologies, for example in America's first net-zero energy retail store.

Data Integration, Automation and Controls

Integrating big data maximizes efficiencies through real-time monitoring and optimization. GIE works with leading innovators to customize controls and data analytics solutions.

Fuel Cells

Fuel Cells convert chemical energy into electricity. GIE pioneered America's first ever state Microgrid in Hartford, CT, using fuel cells to protect critical community infrastructure.

Our Clients include

WINTRUST Chicago

THE UNIVERSITY OF CHICAGO

Google

UBS

EMPIRE STATE REALTY TRUST

Cypress College

Trinity Health

CBRE GLOBAL INVESTORS

Dignity Health

LENNAR

JLL

Walgreens

Why choose GI Energy

1. Focus on financial as well as energy efficiency
2. Independent experts: vendor and technology neutral
3. Full service provider, from scoping to long-term O&M
4. GI Energy warrants the output of its on-site solutions
5. Intimate knowledge of utility markets and tariffs

Case Studies

Cornell Tech
New York, NY

CORNELL TECH

Ground Source Heat Pump geothermal energy system for campus' first academic building, The Bloomberg Center

New Cornell University applied tech campus on Roosevelt Island, NYC

GSHP system provides majority of heating and cooling load. Originally designed to support The Bloomberg Center to be one of the largest Net Zero buildings in the USA

GIE provided engineering, procurement & construction (EPC)

Hunters Point
San Francisco, CA

LENNAR

Eco-District: Utilities Design, Construction, Ownership, Operations & Management

Ground-breaking eco-district design: mixed-use development, integrating sustainable energy generation with smart technology systems

GIE leading team of experts, responsible for sustainable energy, water systems, telecomms & waste management. Partners include Edison Energy, AlfaTech, Tesla & Bloom Energy

GIE arranged third-party financing, and is providing EPC services

Walgreens

Walgreens

Evanston, IL

Walgreens debut Net-Zero Energy store

Integrated GSHP system with natural ventilation, daylighting, solar PV and wind turbines

First 100% CO_2 refrigeration integrated with geothermal in USA

Amongst many other awards, has won: LEED Platinum, Green Chill Platinum, USGBC Emerald Award, Excellence in Engineering ASHRAE Award

North Shore Towers

Long Island, NY

4.5 MW Reciprocating Engine CHP System

Grid-Isolated 1,844 unit residential community, continuous operation critical for vulnerable residents

GIE provided full EPC for project

GIE recognized management's priority was resident safety, and was awarded contract due to superior engineering ensuring no power outages during installation

GI Energy Projects with LEED certification include

US Embassy, 9 Elms, London, UK (Platinum)

TransAmerica Pyramid Center, San Francisco, CA (Platinum)

Walgreens, Evanston, IL (Platinum)

Cornell Tech, Roosevelt Island, NY*

Hunters Point, San Francisco, CA*

Empire State Building, New York City, NY (Gold)

Federal Center South, Seattle, WA (Gold)

Trevor Day School, New York City, NY (Gold)

One Market Plaza, San Francisco, CA (Gold)

University of Chicago, Chicago, IL (Silver)

One Penn Plaza, New York City, NY

North Shore Towers, New York City, NY

Gateway Plaza, White Plains, NY

College of the Canyons, Santa Clarita, CA

*In progress, designed with Platinum LEED certification as key objective

(312) 894-4646 | info@gienergyus.com

NEW YORK • CHICAGO • SAN FRANCISCO • LOS ANGELES

GI Energy

Energy Independence, Security & Savings

Microgrid Development Reference – Hartford, CT

February 2017

gi energy

Contents

The Challenge

Older Technologies Are Less Reliable

Issues Around Grid Reliability

Major power interruptions caused by storms

Essential local facilities not operational for lengthy periods

Emergency readiness is hindered

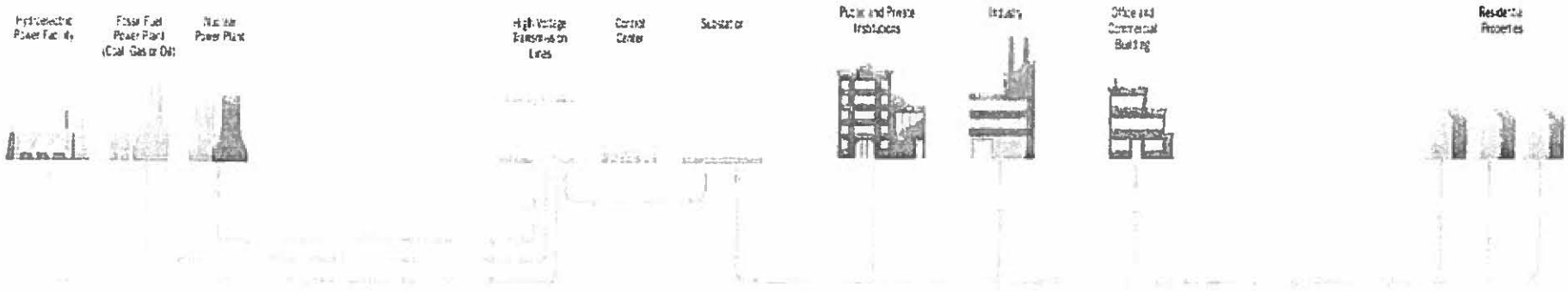
Increased regulatory pressure to increase resiliency

DVIDSHUB, Flickr.com

- Today's energy infrastructure is vulnerable to interruption by storms and other disasters. As mentioned in the Two Storms Final Report (State of CT, 2012) in 2011 a nor'easter and hurricane Irene resulted in over 800,000 outages each and took between 9-12 days to restore power. A Category 3 hurricane may black out the entire State of Connecticut, some areas for over a month.

- A more resilient energy system will be better able to power our homes, businesses, and economy in the face of increasingly prevalent extreme weather events.

The Traditional Power Grid:

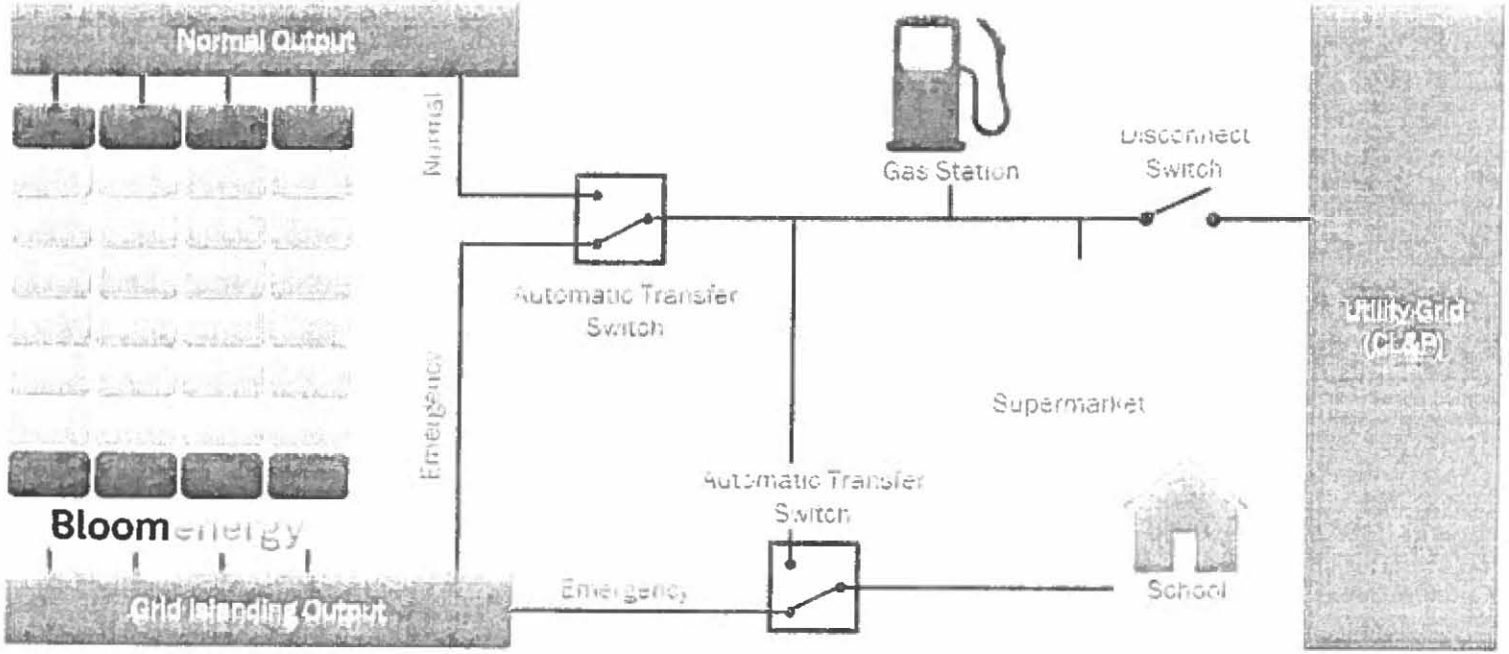


Solution: Microgrids

New Technology Enables New Solutions

Microgrids are just that - the grid in miniature. It is a group of interconnected critical loads and local on-site generation that act as a unit. A microgrid can operate in parallel with the grid when it is operating, or it can operate completely independently during island mode. This is due to advancements in control and automation and new policies that enable cost-effective use of the generators 24/7/365.

- Takeaway: microgrids enable cheaper, cleaner and more resilient local infrastructure that improves emergency response



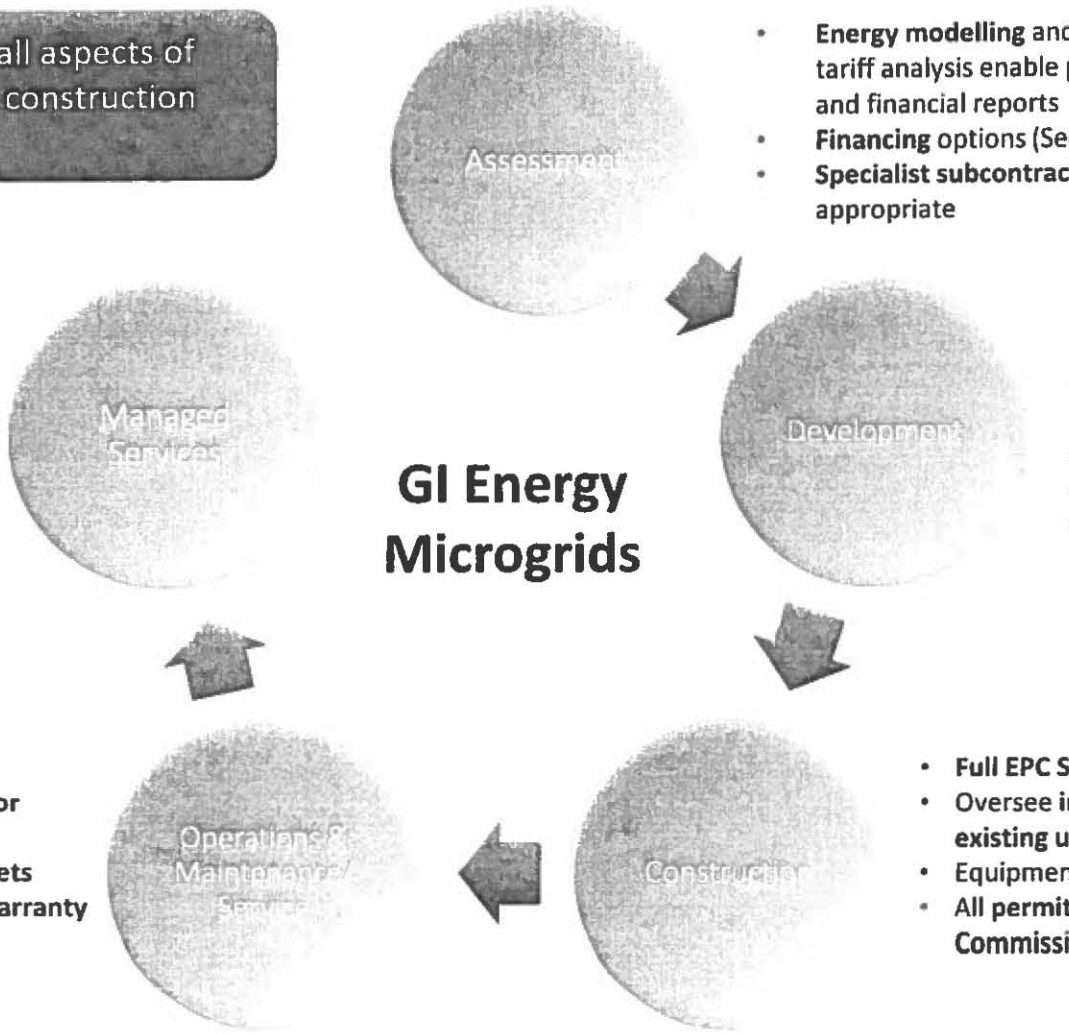
Example Microgrid Diagram

Credit: Antonio Matta, City Architect, Hartford, CT

Microgrid Development Process

Delivering Microgrids for Clients

GIE is responsible for all aspects of project development, construction and operation.



- **Energy modelling** and incentive & utility tariff analysis enable production of technical and financial reports
- **Financing** options (Secure DEEP grants)
- **Specialist subcontractors** sourced as appropriate

- **Design of optimal on-site energy generation mix**
- **All engineering services**
- Equipment lifecycle analysis
- **Management of interaction with utilities**

- **Full EPC Solutions**
- Oversee **interconnection to existing utilities**
- Equipment procurement
- **All permitting arranged** before **Commissioning of asset**

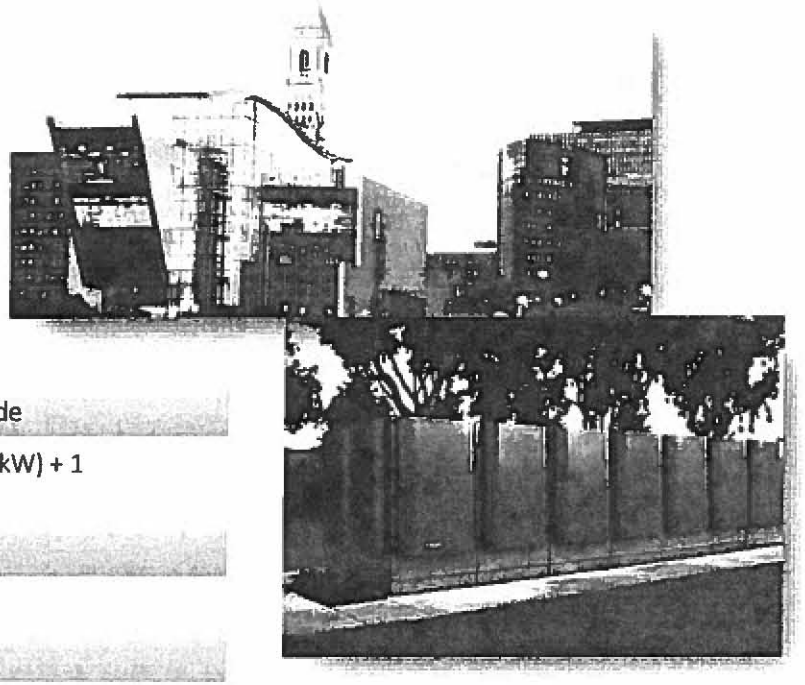
- Provide **on-site training for maintenance staff**
- **Operations of energy assets**
- Parts procurement and **warranty management** as required

- Continuous optimization
- Performance tracking and **utility analysis**
- Fuel sourcing & procurement

GI Microgrid Development in Connecticut

Case Study - Parkville

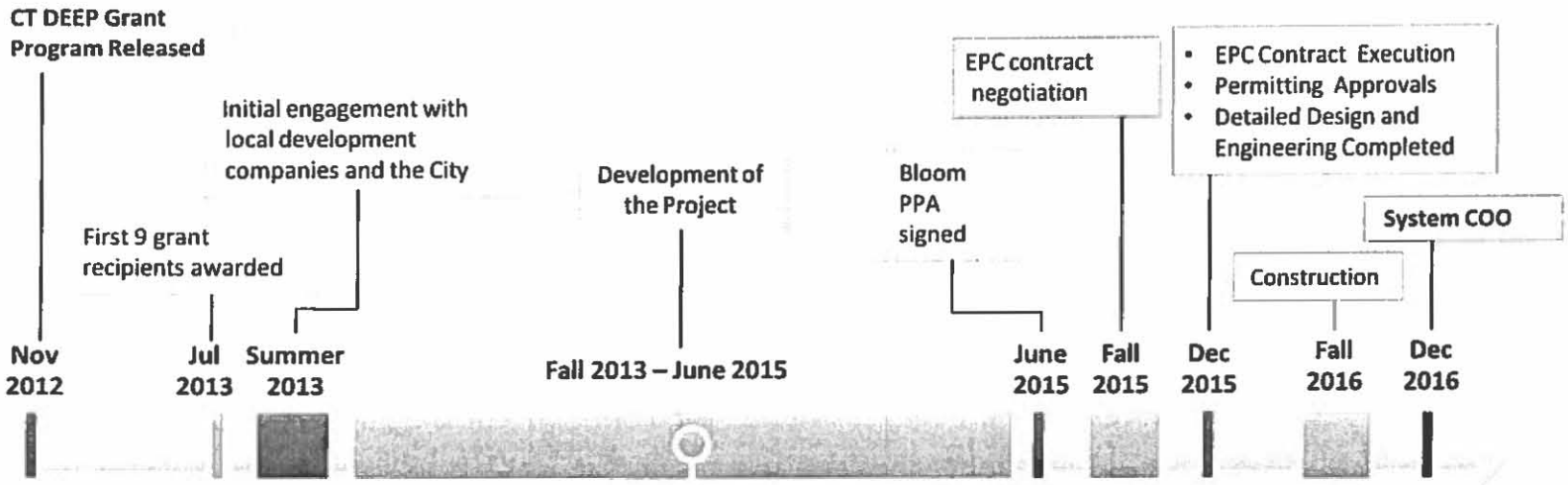
- **Microgrid will provide uninterrupted power for school, gas station, and grocery store during grid outages**
- First microgrid project in CT
- 800 kW Bloom Energy fuel cell microgrid for Parkville section of Hartford
- Funding includes $2.1M grant from State of Connecticut secured by GIE, Virtual Net Metering, and RECs



Size	800 kW grid parallel / 600 kW microgrid-mode
Power Generation Technology	Bloom Energy Servers (4 ES5 fuel cells x 200 kW) + 1 Uninterruptable Power Module (UPM)
Microgrid Equipment	Switchgear and Cabling
Microgrid Owner	Eversource
Bloom Server Owner	Bloom Energy / Constellation
Design & Development	GI Energy
Utilities	Eversource / Connecticut Natural Gas
Interconnection	Parallel grid Connection + Critical Load (microgrid mode)
Customers	Parkville Elementary School, Senior Center, Library – Dwight Branch, C-Town Supermarket

Project Timeline and Milestones

Case Study - Parkville



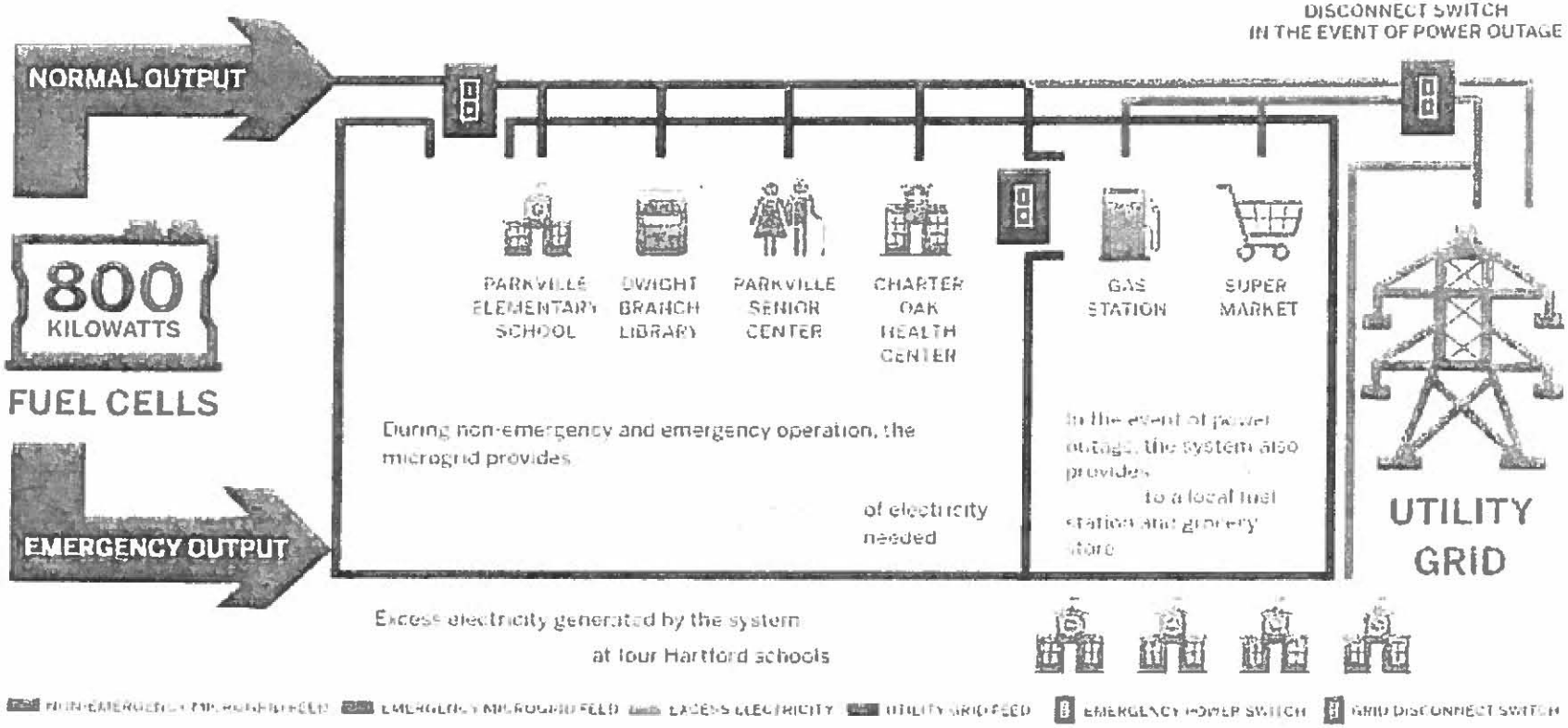
Graphic Credit: Matta, Hartford CT

Key Development Activities

- **Selection of generator technology**: Initially CHP but lack of onsite heat load led to use of a Bloom fuel cell
- **CT LREC bid submission and award:** Bidding strategy required to ensure you are "picked up" while protecting project economics
- **Virtual Net Metering:** Site load under normal conditions @ 20% of fuel cell output required a structure to export excess energy that is only used by the MicroGrid during grid outages
- **Securing Eversource engagement and sign-off**: New model for all parties requiring a collaborative effort
- **Ensure adequate pipeline gas pressure:** Dedicated high pressure gas line for Bloom fuel cell provides extra reliability but greater upfront cost

How a Microgrid Works

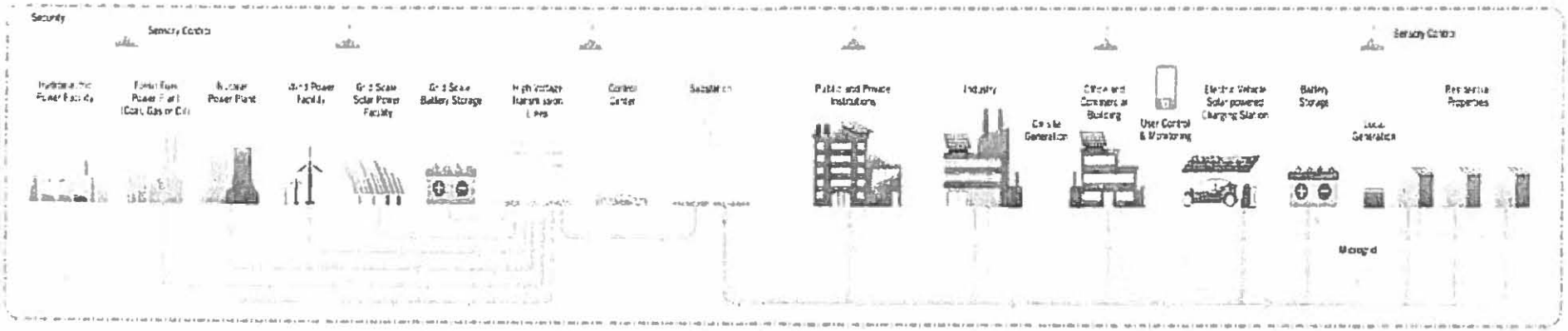
Case Study - Parkville



Graphic Credit: Constellation Energy

Takeaways & Next Steps

- Today's energy infrastructure is vulnerable to interruption by storms and other disasters.
- Municipalities need to take advantage of new technologies that increase resilience and enhance emergency response
- GI Energy has successfully secured incentives for two Connecticut municipalities. Further we supported the development of the Parkville microgrid through completion



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

Thomas A. DeGise
Hudson County Executive
County of Hudson
567 Pavonia Avenue, 4th Floor
Jersey City, NJ 07306

Dear Mr. DeGise:

The NJBPU Town Center DER Microgrid Evaluation Team (Evaluation Team) has received your application for a TC DER microgrid feasibility study incentive. While this application was accepted for evaluation, there are a number of items that are required to be submitted in order to complete that evaluation. These items are listed below:

1. A general description of the overall cost

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

COUNTY OF HUDSON
OFFICE OF THE COUNTY EXECUTIVE
BRENNAN COURT HOUSE
583 NEWARK AVENUE
JERSEY CITY, NEW JERSEY 07306
PHONE: 201-795-6200
FAX: 201-714-4825

THOMAS A. DE GISE
COUNTY EXECUTIVE

May 1, 2017

Mr. Michael Winka
Sr. Policy Advisor
NJ BPU
44 S Clinton Avenue
Trenton NJ 08625

RE: Town Center MG Grant Application

Dear Mr. Winka:

Hudson County is pleased to submit the requested general description of the overall cost information for the NJBPU Town Center DER Microgrid Grant Program.

The following is a breakdown of the Best and Final Offer for our proposal:

- Lead Investigator – Greener by Design $50,000
- Sub-Consultant – CHA $50,000
- Sub-Consultant – GI Energy $50,000
- Total Request - $150,000

Very truly yours,

Thomas A. DeGise

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.

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[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
HUDSON COUNTY

THIS MEMORANDUM OF UNDERSTANDING ("MOU"), is made this _____ day of _____, 2017, by and between **HUDSON COUNTY** ("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 $150,000, 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

Hudson County
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: Hudson County

_____ 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: _____