

Town Center Distributed Energy Resource Microgrid Feasibility Study Incentive Program

Phase 1 Application Process

Background

The U.S. Department of Energy Microgrid Exchange Group defines a microgrid as:

“An integrated energy system consisting of a group of interconnected loads and distributed energy resources (DER) with clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid and can connect and disconnect from the grid to enable it to operate in both grid connected or island mode.”¹

A Town Center DER microgrid, for the purpose of this incentive program, is a cluster of critical facilities within a municipal boundary that may also operate as shelter for the public during and after an emergency event or provide services that are essential to function during and after an emergency situation. The Town Center DER microgrid could include, but not be limited to, multifamily buildings, hospitals, and local or state government critical operations in a relatively small radius.² These critical facilities are connected to a single or series of DER technologies that can operate while isolated and islanded from the main grid due to a power outage. In some cases these are termed an advanced microgrid since they connect multiple customers across multiple rights of ways within a municipality.

Based on a review of the events and consequences from several recent extreme weather events on New Jersey’s energy systems, the 2015 Energy Master Plan Update (EMP Update) established a new overarching goal: “Improve Energy Infrastructure Resiliency & Emergency Preparedness and Response.” One of the EMP Update’s new Plan for Action’s policy recommendations included: “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.”³ This new policy recommends that:

“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 microgrids to power critical facilities and services across the State.”

¹ <https://building-microgrid.lbl.gov/microgrid-definitions>

² As general rule of thumb guidance this distance would be at a maximum 1 mile or less since overall costs will increase with the distance between multiple facilities.

³ http://nj.gov/emp/docs/pdf/New_Jersey_Energy_Master_Plan_Update.pdf

The Town Center DER Microgrid – Feasibility Study Incentive Program is the first step in implementing this new policy goal.

Because of the impacts of these weather events, the State of New Jersey has entered into two Memoranda of Understanding (MOU) with the U.S. Department of Energy (USDOE) to evaluate the potential of developing ER microgrids on two key projects: (1) a microgrid within the northeast portion of the NJ Transit system (NJT Grid) and (2) a microgrid within the PSE&G service area in the City of Hoboken. To test the feasibility of these two projects, the USDOE provided funding for both the NJT Grid and the Hoboken microgrid to evaluate the improved resiliency in these proposed systems when the grid is down. In addition, the Board of Public Utilities (BPU) worked with the New Jersey Institute of Technology (NJIT) to map potential Town Center DER microgrids. The resulting report (NJIT Report) mapped 24 potential Town Center DER microgrids across the 17 municipalities in the 9 Sandy-designated counties attached as Appendix A.

New Jersey has at least 45 operating DER microgrids. These microgrids are single building or a campus setting microgrids with mostly a single DER technology. The current main New Jersey DER microgrid technology is natural gas combined heat and power systems.

As documented in EPRI's report *The Integrated Grid*,⁴ DER systems can:

1. benefit the distribution grid because of their increased efficiencies;
2. assist in managing the quality of power on the grid including enhanced voltage controls and balancing real and reactive power; and
3. provide energy, capacity and other ancillary services to the larger grid, which can potentially provide additional revenues to the DER system;

A key aspect noted by EPRI's report is that DER can help to optimize the operations of the distribution grid by being fully integrated with distribution grid operations. That optimization requires the input, cooperation and coordination by the Electric Distribution Companies (EDC).

It should be clear to any applicant upfront in this process that while there are strong benefits including security, reliability, resiliency, energy saving and environmental, there are also costs and impacts of those costs. All of these costs and benefits need to be evaluated and assessed in an open and fair process. EPRI advanced the principles of the benefits of DER on the distribution system as an integrated grid through their

⁴ <http://www.epri.com/Our-Work/Pages/Integrated-Grid.aspx>

Integrated Grid Benefits-Cost Framework.⁵ This incentive program will require the development of a detailed cost benefit analysis. At a minimum, that will include an initial assessment through the Rutgers' DER Cost Benefit analysis model.

Per USDOE's various energy laboratory microgrid reports, microgrids if designed, constructed and operated properly can increase distribution grid system reliability, resiliency and efficiency with the use and integration of DER technologies.⁶ However, these general statements depend on case specific design details. A key barrier to developing Town Center DER Microgrids is the availability of detailed data on the costs and benefits of specific projects. BPU is establishing a Town Center DER Microgrid - Feasibility Study Incentive program that will assist in the development of this case specific data for the evaluation, assessment and demonstration of potentially successful implementation of advance microgrid pilots on a community scale across the state.

The Town Center DER Microgrid Feasibility Study Incentive program is intended to serve as one part of guidance for the BPU in establishing a statewide microgrid policy for connecting multiple customers across multiple rights of ways (ROW) and can include both electric and thermal energy. The focus in this initial program is on critical facilities at the local level. Critical facilities will be classified as:

- A public facility, including any federal, state, county, or municipal facility,
- A non-profit and/or private facility, including any hospital, police station, fire station, water/wastewater treatment facility, school, multifamily building, or similar facility that :
 - is determined to be either Tier 1 or critical infrastructure by the Office of Emergency Management or the Office of Homeland Security and Preparedness or
 - could serve as a shelter during a power outage.⁷ . They must be able to document the ability to be a shelter during an emergency when there is a major grid outage.

Target Market and Eligibility

The Program would be managed by BPU through a Memorandum of Understanding (MOU) between the Town Center DER public partners and the BPU. With its application, the Town Center DER public partners will provide a letter of support from the local electric distribution company (EDC LOS) which details the EDC's willingness to

⁵ <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002005003>

⁶ <http://www.energy.gov/oe/services/technology-development/smart-grid/role-microgrids-helping-advance-nation-s-energy-syst-0>

⁷ A shelter must have the ability to provide food, sleeping arrangements, and other amenities to the public during and after an emergency.

assist in the study. The MOU and the EDC LOS will be part of staff's recommendation in the Board's Order to approve the Town Center DER microgrid feasibility study incentive.

The Program will be managed in two phases one for a feasibility study and the second for detailed engineering design.⁸ This application is only for feasibility studies. Initial feasibility evaluations are capped at \$200,000. An applicant must have a BPU approved feasibility study or equivalent to be eligible for any subsequent detail engineering design incentives.

The applicant must be a government entity including municipal or county agency that owns or manages critical facilities. There must be one lead local government agency but all current local government agency partners will be required to enter into the overall agreement. The BPU seeks applicants that show a high degree of planning and ability to implement all or portions of a micro grid proposal. This will include the ability of the local government entity to enter into agreements with the BPU, its partners and the local electric and gas utility to assist in the feasibility study.

The Town Center DER Microgrid – feasibility study incentive program is initially open to proposed Town Center DER microgrids that include critical facilities identified in the NJIT report or similar Town Centers within the 9 Sandy designated counties that can document that they satisfy the screening criteria set forth in the NJIT report.

The Town Center DER Microgrid – feasibility study incentive program is not open to single-building or campus-setting microgrids that are eligible for other NJCEP incentives. This incentive program is not to evaluate or perform a feasibility study for an individual customer or single building microgrid; or a campus setting microgrid. Public sector, not for profits and colleges/universities single building or campus setting microgrids can obtain a high level assessment of their potential microgrid through the local government energy audit (LGEA) program.

The feasibility study incentive program is for a project that includes multiple critical facility customers in a single municipality developed as an advanced microgrid. The advanced microgrid must have a nucleus of critical buildings and customers that can provide essential services and emergency energy 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.

Applicants must demonstrate an ability to incorporate multiple critical facility stakeholders into the Town Center DER microgrid. Each applicant must identify the

⁸ The second detail engineering design incentive is TBD and depends on the Board's approval of the budget allocation and program details.

proposed stakeholder groups, how they were identified, and level of commitment to participate in the feasibility study program. Applicants must demonstrate a firm understanding of the technical and power infrastructure needs of each critical facility stakeholder. This would include any initial early stage studies of the overall Town Center's energy needs both electric and thermal, the types of DER technologies, interconnection technologies, utility requirements and any initial microgrid cost/benefit modeling. This feasibility study incentive is not for early stage planning needs and such studies will not be funded.

The applicant's residents must be serviced by a regulated electric utility that pays a societal benefits charge (SBC) on their electric bill.

For the first round of applications the consultant for the local government is limited to one award.

Program Technical Requirements

Town Center DER Microgrid applicant must submit a pre-application that includes at a minimum the following:

1. Project Name
2. Project Description including all potential critical facilities with a description of why they are critical facilities within the proposed Town Center DER Microgrid. This should include the following:
 - i. approximate size of the project in energy (electrical and thermal);
 - ii. approximate electric and thermal load of each building;
 - iii. the estimated square footage of each building and the total project;
 - iv. the overall boundaries of the proposed project and distance between critical facilities; and
 - v. the FEMA Category Classification of each building
3. If applicant is not a Town Center identified in the NJIT report, documentation indicating that it satisfies the screening criteria set forth in the NJIT report is required as follows:

Criteria were based on a cluster of critical facilities that included the following ranking:

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

2. Total electric and thermal loads based on Btu's per square foot.
3. A Town Center should have at least 2 Category III or IV facilities within 0.5 miles and a facility with an energy usage of approximately 90 M Btus per square foot.
4. A list of all potential partners to be included in the Town Center DER microgrid MOU.
5. A general description of the technology to be developed within the Town Center DER Microgrid. This should include a description of the proposed connection (electric and/or thermal) of the critical facilities and the DER technologies. This should include a location of the connection to the EDC's facilities/equipment.
6. A general description of the overall cost and potential financing that may be available.
7. A general description of the benefits of the proposed Town Center DER Microgrid as well as the need for the proposed project. Both 6 and 7 should be detailed with any available microgrid modeling efforts that have been performed.
8. Timeframe for the completion of the feasibility study.
9. The specific microgrid modeling to be used in the overall feasibility study.
10. The requested funding amount.
11. Any cost share by the Lead Local Agency or any of the stakeholder partners.
12. An EDC LOS.

Pre-application Review Process

Given the initial limited funding BPU is implementing a quasi-competitive process for the review and approval of the Town Center DER microgrid feasibility study incentive. BPU staff will open a window for pre-applications to be submitted based on the criteria in this application process. The window will be open for 60 days. Based on a review by BPU staff the pre-applications will be ranked based on the below criteria if more pre-applications funding requests are received than total funding available:

1. Distribution of feasibility study projects across all electric utilities. The objective of this criterion is to have at least 1 Town Center DER microgrid feasibility study project in each of the PSE&G, JCPL, ACE, and RECo territories. However, staff may select 2 or more feasibility studies in one specific electric distribution company service territories based on criteria 2 and 3 below.
2. Distribution of feasibility study projects across the state. The objective of this criterion is to have Town Center DER microgrid feasibility study projects in

- different areas of the state based on the qualities of the distribution system, the availability of local services and the proximity of vulnerable communities that would shelter in place.
3. The applicant demonstrates understanding of the technical, financial and power infrastructure needs of each Town Center DER Microgrid stakeholder.
 4. The evaluation of the applicant's proposed project based on the criteria identified in the NJIT Report as follows:
 1. The number of FEMA Category III or IV facilities; and
 2. The total electric and thermal loads based on Btu's per square foot.

If the total available funding for this program is not allocated after the review of the applications submitted in the 60 day time period, the BPU will make recommendations for awards based on a first come first serve basis and will open subsequent funding request windows.

Incentive

The pre-application submittal must be approved by the Board. The Board will issue a Notice to Proceed to confirm the availability and commitment of funding. Phase 1 funding is capped at a maximum of \$200,000. The BPU anticipates between 5 to 10 approved Phase 1 Notice to Proceed letters. The Notice to Proceed will include an MOU between all the Town Center DER public partners, the BPU and the EDC LOS. It will detail the terms of the commitment including timeframes for the completion of the feasibility study.

All payments for the Phase 1 Feasibility Incentive will be made after the completion and acceptance of the final report. A Phase 1 approval is no guarantee of any subsequent incentive nor is it the BPU approval of the DER Town Center Microgrid.

Pre-applications can be submitted to TCDERmicrogrid@bpu.nj.gov