BQDM QUARTERLY EXPENDITURES & PROGRAM REPORT

Q1-2015

ConEdison

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1.0 Background

On December 12, 2014, the New York Public Service Commission ("Commission") issued its *Order Establishing Brooklyn/Queens Demand Management Program ("Order")*.¹ The Order requires Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") to submit quarterly reports to the Commission on its "expenditures and program activity" that include project costs, project in-service dates, Monthly Adjustment Clause ("MAC") recoveries, incremental costs incurred, operational savings, and other benefits. This is the second Brooklyn Queens Demand Management ("BQDM") quarterly report ("Report") and primarily covers expenditures and program activity for the first quarter ("Q1") of 2015.

2.0 Executive Summary

2.1 Costs and Recovery

The Company spent \$1.53 million on the BQDM Program during the first quarter 2015, and has spent \$2.69 million to date (see <u>Figure 1</u> and <u>Table 1</u>). The costs incurred during the quarter are being amortized over a period of 10 years and recovered through the MAC in accordance with the Order.²

¹ Case 14-E-0302 – Order Establishing Brooklyn/Queens Demand Management Program, issued and effective December 12, 2014.

² See <u>http://www.coned.com/documents/elecPSC10/GR25-Forms.pdf</u>, Leaf 338, Section 26.1 and Leaf 341, Section 26.1.1 (22). Note that the Company may reassign costs incurred before the approval of the BQDM Program to the BQDM Program established after the issuance of the Order consistent with Leaf 343.1, Section 26.1.1 (43).



| Programs/Projects | Jan-15 | Feb-15 | Mar-15 | Q1-2015 Total | BQDM Total |
|--------------------------------------|--------|--------|--------|------------------|---------------|
| Virtual Energy Audits | \$.00 | \$.00 | \$.04 | \$.05 | \$.06 |
| SBDI Incentives | | \$.43 | \$.46 | \$.89 | \$1.77 |
| Multi-Family Incentives | | | \$.01 | \$.01 | \$.01 |
| NYCHA Opportunity Scoping | | \$.08 | \$.04 | \$.13 | \$.21 |
| Marketing | | | \$.05 | \$.05 | \$.05 |
| Analytical Tools and Technology | \$.01 | \$.00 | \$.34 | \$.36 | \$.51 |
| M&V | | | \$.00 | \$.00 | \$.00 |
| Miscellaneous | \$.00 | \$.00 | \$.01 | \$.01 | \$.04 |
| Distributed Energy Storage System | | | \$.01 | \$.01 | \$.01 |
| DC Link Microgrid | | | \$.02 | \$.02 | \$.02 |
| Voltage Optimization | | | \$.01 | \$.01 | \$.01 |
| Total | \$.02 | \$.53 | \$.99 | \$1.53 | \$2.69 |

Table 1: BQDM Program First Quarter 2015 Expenditures

The work to implement the energy efficiency adder programs (which are described in more detail in Section 3 of this Report), research new technologies, manage RFI, RFP and other acquisition activities, and develop foundational elements of the program (i.e., accounting protocols, regulatory reporting, marketing approaches and outreach) was primarily conducted by Con Edison employees. The Company has developed a General Accounting Procedure ("GAP")³ for treatment of costs and collections associated with the BQDM Program and has established internal billing accounts to properly manage program expenses.

2.2 Projects Summary

At the end of the first quarter of 2015, the Company had contracted for 11.1 MW⁴ of load relief for efficiency measures at 2,616 small business and 548 multi-family buildings as illustrated in

Figure 2.

³ The Company filed the GAP with the Commission on February 10, 2015.

⁴ The load relief quantity refers to the cumulative load relief, i.e., it includes load relief from activity prior to the quarter. The Company will report load relief on both a quarterly and cumulative basis henceforth. Also note that costs included in this Report do not directly relate to the load relief quantity, as explained in the footnote to Figure 1





BQDM Program Load Relief Progress*

Figure 2: BQDM Program Load Relief Progress

* (i) "Operational" refers to the quantity of load relief the Company estimates the technologies and/or measures that have already been installed will contribute during some or all of the forecasted overload period;

(ii) "Contracted" refers to the quantity of load relief the Company estimates the technologies and/or measures that have been sold, both installed and operational, and not yet installed, will contribute during some or all of the forecasted overload period.

The Company began and/or continued to pursue other load relief opportunities on both the customer side and utility side as shown in <u>Table 2</u>. The Company efforts during the quarter are described in greater detail in Section 3 of this Report.

| | Design Stage* | Deployment Stage* |
|---|------------------|----------------------|
| Customer-side Solutions | | |
| Small Business Direct Install | | ٧ |
| Multi-family Energy Efficiency | | ٧ |
| Residential Energy Efficiency Program(s) | V | |
| NYSERDA CHP Program | V | |
| Virtual Building Audits | | V |
| New York City Housing Authority Scoping | | ٧ |
| Direct Customer Activity | v | |
| Dynamic Resource Auction** | V | |
| Fuel Cells | v | |
| Queens Resiliency Microgrid | V | |
| City Agency Solutions | v | |
| Utility-side Solutions | | |
| Distributed Energy Storage System | v | |
| DC Link Microgrid | v | |
| Voltage Optimization | v | |
| Utility Side PV Pilot | v | |
| Fuel Cell | v | |
| Foundational Elements | | |
| Distributed Energy Resource Evaluation Tool | | V |
| Solutions Technology Validation | | ٧ |
| Community Engagement and Outreach | | V |
| Auction Designs and Analyses | V | |

Table 2: BQDM Program Activity

*- "Design Stage" refers to early efforts initiated by the Company during the quarter to determine whether, and if yes, how to proceed to implementation in a manner consistent with the objectives of the BQDM program. "Deployment Stage" refers to implementation efforts either substantially complete or well underway that are serving to meet the objectives of the BQDM program.

** - Market-driven approaches to procure demand response type resources with specific performance attributes.

2.3 Operational Savings and Other Benefits

The Company defines "operational savings" as reductions in costs incurred or expected to be incurred by the Company for the operation of the electric sub-transmission and distribution system supporting the BQDM target area. No operational savings have yet been identified as resulting from activities conducted in the first quarter of 2015.

The majority of the load relief the Company acquired during the first quarter of 2015 came from the Small Business Direct Install ("SBDI") adder initiative. SBDI is an Energy Efficiency Portfolio Standard ("EEPS") program and the adder provides an additional incentive through the BQDM Program, over and above the incentive provided through SBDI, to increase SBDI participation in the BQDM Area ("BQDM Area" or "BQDM Target Area" or "Target Area").⁵ Under the SBDI adder initiative, more than 2,616 small businesses in the Brooklyn-Queens Area have installed or agreed to install efficiency measures that will collectively reduce electricity demand by 9.8 MW, reduce electricity bills for these customers by an average \$3,100 per year, and result in approximately 7,227,550 kWh of annual consumption reduction. The outreach to these businesses, in an area that continues to undergo considerable change, has been a positive development for the BQDM project. Participation by these small businesses will deliver direct benefits to a very important segment of the community, and contributes to establishing a positive experience in the wider community as the project progresses.

⁵ References to Brooklyn-Queens Area in this filing refer to north central and eastern Brooklyn neighborhoods, including parts of Greenpoint, East Williamsburg, Bushwick, Bedford-Stuyvesant, Crown Heights, East Flatbush, Brownsville, and East New York, and southwestern Queens neighborhoods, including parts of Richmond Hill, Howard Beach, Broad Channel, Ozone Park, South Ozone Park, Woodhaven and Kew Gardens.

Additionally, the SBDI Adder initiative outcomes are anticipated to displace peaking generation and reduce wholesale capacity needs.

A small portion of load relief was also secured during Q1 2015 through an adder to the EEPS Multi-Family Energy Efficiency ("MFEE") initiative. The MFEE Adder initiative commenced in December 2014. Results through April 4, 2015 include the in-dwelling and common area measures representing approximately 1,446 kW of load reduction.

3.0 Program Activity

3.1 Customer-side Solutions

In order to produce rapid results, the Company looked at resources already in place and operating that could produce additional load reduction within the BQDM Area. The Company also reviewed, through internal meetings and through discussions with the New York State Energy Research and Development Authority ("NYSERDA") residential EEPS program management and Combined Heat and Power Program management teams, the extent to which the programs could respond quickly to deliver early results. The Company's SBDI Program and the MFEE Program, both direct installation programs, offered the best potential to provide an implementation vehicle with proven technologies, which the Company could use with high confidence in their load reductions. These programs have been augmented with incentive adders since the BQDM program's inception to produce results in the BQDM Area. Importantly,

the programs have also enabled the Company to positively engage important members of the targeted community.

Small Business Direct Install Program

The Company initiated the "SBDI Adder" initiative on August 1, 2014. The SBDI Adder initiative is open to commercial customers with a peak demand of 110 kW or less. Participating customers receive a walk-through survey identifying cost-effective electric efficiency measures. Customers may elect to have all or any of the recommended measures installed. The basic EEPS SBDI Program provides a payment of up to 70 percent of costs for the selected measures and the customer is responsible for the remaining amount. Under the SBDI Adder initiative, customers in the covered networks will receive 100 percent of costs, so measures are installed at no cost to them. The Company delivers this program through an implementation contractor responsible for the sales and installation of measures.



The status of SBDI Adder initiative as of April 3, 2015 is set forth below.



Response in the first quarter continued to be strongly driven by a focused outreach to small businesses in the community. As of April 3, 2015, 9.8 MW of load reduction projects, involving 2,616 small business customers, have been committed. A total of 6.36 MW had been installed as of April 3, 2015, at 1,838 customer sites.



Multi-Family Energy Efficiency Program

The Company developed an adder initiative for the existing EEPS MFEE program, which offers multi-family dwellings of 4-75 units a survey identifying potential load-reduction measures. This existing, or basic, program includes both measures installed within the dwelling units and measures installed within the common areas. Under the EEPS program, 100 percent of the cost of measures installed within the dwelling units is covered, but the program requires a landlord or building manager contribution for a percentage of the cost of measures installed in the common areas. Under the BQDM MFEE Adder initiative, eligible buildings within the BQDM networks will continue to have no out-of-pocket costs, for measures installed in the buildings, for the customer in a dwelling unit, but will also receive the full cost of measures in common areas. The MFEE Adder initiative is delivered through a central implementation contractor that in-turn is utilizing four independent subcontractors within the BQDM area.

The MFEE Adder initiative commenced on December 10, 2014. Results through April 4, 2015 include the in-dwelling and common area measures in approximately 549 buildings, representing approximately 1.3 MW of load reduction. The program typically delivers approximately 75 percent of its load reduction contribution through the common area measures. The MFEE initiative provides valuable load relief that typically extends into late evenings, and is thus coincident with the peak of the networks targeted by the BQDM program. The Company projects that this initiative will deliver around 2 MW by the summer of 2016.





The status of the MFEE initiative as of April 3, 2015 is set forth below.



Customer-side Solutions Pipeline Activities Residential Energy Efficiency Program(s)

The Company has reviewed the existing residential energy efficiency programs offered by both NYSERDA and the Company. These programs tend to focus on measures which deliver kWh and heating fuel savings and are designed in a manner which does not correspond well with the specific objective of the BQDM program, which is to achieve load relief during hours of overload. With the greater flexibility enabled via the BQDM program, the Company is seeking to design a residential program that will enable it to advance new opportunities in this important space which align with the needs of the BQDM program.

CHP and Alternative Solutions

The Company worked closely with NYSERDA's combined heat and power ("CHP") program administrators as well as the natural gas provider in the area], National Grid ("NG"), and its CHP team to investigate the potential for CHP development. The Company conducted an initial review of typical CHP system costs and benefits, based upon preliminary and incomplete data of very site specific projects, and found positive potential for CHP projects. Not wishing to delay engagement while economic evaluation continued (as explained in more detail below), the Company began work to identify viable potential candidates for new CHP system installations. This has included working with NG to identify where high pressure natural gas is available or could be readily supplied. Forty customers in the Brooklyn-Queens Area were identified based on their electric load and the likelihood of a sufficient thermal load to potentially justify CHP installations at their sites. These customers were sent letters jointly

branded by the Company, NYSERDA and NG that identified benefits and potential available incentives for a CHP installation. While there were no responses from the customers to this initial approach the Company continues to review energy usage of these customers to identify opportunities where they can use either CHP or other alternative solutions to more efficiently manage their energy needs while also providing load relief to the system.

Initial analysis of CHP systems in operation today, which are operated to follow the thermal load of the facility, has identified that a number shut down completely or reduce output in the summer. The Company is continuing its effort to identify systems within the Brooklyn-Queens Area that operate in this manner to explore the potential for the CHP systems to change their summer operations to provide peak load relief. The Company recognizes that gaining more output from existing systems is potentially a quicker outcome than installing new systems. Significant variation in the design and the actual operation of the CHP system and the customer's business operation and ability to respond is to be expected, so any initiative will potentially need to be tailored to each location individually. As each opportunity is identified and evaluated, a "retro-commissioning" for such CHP systems may be considered. Such an initiative involving analyses of customer energy use patterns may also serve to inform analysis of viable alternative solutions such as fuel cells, as further discussed below.

Innovative Distributed Generation-Fuel Cells

The Company continues to conduct analysis to acquire resources so that the portfolio of solutions serves to meet the reliability needs in the targeted area during the entire period of

overload. To provide additional assurance that the Company has sufficient resources to meet its reliability needs, while also being cognizant of potential resiliency benefits, the Company is investigating possible innovative solutions besides CHP that would provide load relief during the entire period of more than 12 hours of potential overload. In particular, the Company is studying the viability of utilizing efficient fuel cells that generate electricity through noncombustion chemical mechanisms, or other similar resources that are able to provide long periods of load relief efficiently and reliably, with minimal operational overhead, and which can be built with minimal lead time while utilizing a small footprint in the land-constrained targeted area.

New York City Housing Authority

The Company identified that publicly administered housing buildings within the BQDM Program Target Area account for over 46 MW of demand, including over 60 complexes and over 29,000 housing units. The Company is working with the New York City Housing Authority ("NYCHA") and a contracted partner to identify opportunities in such facilities. In addition to identifying the energy and demand savings opportunities, the Company is also working to identify existing funding opportunities which may be available but may not as yet be fully leveraged.

By the end of first quarter 2015, an initial draft report was delivered and the final report was nearing completion. The draft report identified 26 potential load reduction measures, estimated peak demand reduction impacts for each measure, and the associated costs to implement each measure across the entire NYCHA portfolio in the BQDM area. The suite of

measures takes a holistic approach, including common area and in-unit lighting, HVAC retrofits, ventilation and other electric systems maintenance and upgrades, building envelope improvements, and tenant and staff education programs. The report also discusses potential financing models and implementation considerations.

The Company intends to review the report, analyze measures on an a-la-carte basis, and work jointly with NYCHA to review the findings of the investigation and identify which measures are cost effective and actionable within the BQDM Program timeframes. NYCHA may have specific buying approaches which may provide a vehicle to pursue some of the solutions identified, and there may also exist opportunities to pilot new solutions in conjunction with any already planned NYCHA capital projects.

Direct Customer DER Provider

The Company initiated exploration of opportunities with a large customer in Queens for load relief and other benefits. Discussions have included the potential for installation of a natural gas behind-the-meter generator to both power a community micro-grid and for potential use as a demand response resource. The Company also explored other possibilities, such as an on-site solar installation and the use of the location as an emergency staging area. This is a complex potential project and conversations with the customer and other stakeholders are on-going.

The Company has had initial conversations with other specific customers and expects such exploratory conversations to continue during the course of the BQDM program.

Dynamic Resource Auction

The customer-side solutions described above, together with non-traditional utility side solutions, are anticipated to provide sufficient load relief to alleviate potential overloads during the summer of 2016. However, in order to meet the reliability need around the peak hour (10 pm) in the targeted area in subsequent years, the Company is investigating market-driven approaches to procure resources with specific performance attributes. In particular, the Company is studying the feasibility of conducting auctions to solicit resources that can respond in a dynamic fashion.

The resources being sought are dynamic, i.e., callable, and are expected to be dispatched during the BQDM Area peak period. The Company anticipates obtaining the resources through a competitive market acquisition process, likely an auction, which would attract a cost-effective mix of demand response ("DR") type solutions to meet performance objectives set by the Company.

Request for Information ("RFI")

On July 15, 2014 the Company issued a broad RFI, which closed on September 15, 2014 and drew 78 proposals. An RFI, by its nature, allows for broader responses than an RFP but requires a greater level of scrutiny and validation of the information provided. The proposals presented via the RFI have provided the Company with valuable insight into potential solutions, including indicative pricing, operational needs and reliability, potential environmental impacts and, in a few cases, potential customer partners. As the quality of the RFI responses varied significantly,

gaining confidence and insight has taken considerable work. Developing a comparative analysis among the solutions presented has been a complex undertaking.⁶

The Company recognizes that the solutions presented in the RFI responses do not represent the complete universe of potential solutions for the BQDM Program. The Company remains open to other solutions, either via solution providers or customers. The Company will continue to use both RFI submissions and other available solutions to inform subsequent purchasing actions for the BQDM program.

Distributed Energy Resource Evaluation Tool

The Company has built a tool, using both internal and external expertise, to evaluate on a comparable basis a diverse range of distributed energy resources ("DER") while accounting for the duration of their availability (e.g., four-hour battery, eight-plus--hour energy efficiency, two-hour demand response), their risk, their maturity, their flexibility and their ability to otherwise meet the needs in the BQDM Area. The Company also developed a portfolio approach to identify a mix of resources that can meet the reliability need over the 12 hours on a design peak day. Using the evaluation tool, the Company is evaluating DER solutions using a combination of multiple criteria. The tool will be used in the overall evaluation of solutions that will be considered for inclusion in the BQDM portfolio. The Company intends to supplement

⁶ The Company's efforts in this regard are being conducted in a manner to provide the broadest benefit to future efforts by the Company in other targeted projects and to contribute to the Commission's REV initiative.

results from the evaluation with additional assessments of the solutions' ability to meet the BQDM program timing and reliability needs.

Solutions Technology Validation

The Company has validated potential DER solutions for both the quantity of load reduction and the length of the resource's availability (or duration) based on technical judgment provided by internal and external subject matter experts. These assessments of the validated solutions have been incorporated into the evaluation tool criteria.

Community Engagement and Outreach

The Company has continued to be proactive in engaging with community stakeholders to understand the priorities in the diverse and rapidly changing communities across Brooklyn and Queens. In the first quarter of 2015, Con Edison personnel held meetings with 13 elected officials or their staff and four community boards in their district offices regarding BQDM program plans. The Company has also continued its efforts with stakeholders such as local chambers of commerce, Business Improvement Districts ("BID"), Local Development Corporations, community housing associations, and tenant associations with a focus on promoting our MFEE and SBDI Energy Efficiency programs. For example, the Company presented the BQDM program at the 2015 Queens Chamber Energy Summit and the April Brooklyn Borough Board meeting, hosted by the Brooklyn Borough President. These efforts have led to opportunities to present to new audiences, ranging from the broad multistakeholder approach of the Brooklyn Borough President's Renewable & Sustainable Energy

Task Force (ReSET) committee meetings, to neighborhood level presentations, focused on the concerns of the Richmond Hill South Civic Association.

Community engagement is critical to the success of BQDM initiatives and the Company continues to actively reach out to existing community partners and, to develop new relationships with groups in the area such as the Brownsville Partnership. The Company held numerous meetings with Brooklyn and Queens not-for-profit organizations to provide information about the program. During the quarter, we met with a group of Brooklyn based community organizations and the New York City Environmental Justice Alliance to discuss some of their concerns and recommendations. The group, which includes some longstanding Con Edison community partners, formed a new coalition identified as the Brooklyn Alliance for Sustainable Energy (BASE).

3.2 Utility-side Solutions

Distributed Energy Storage System (DESS)

The DESS will provide Con Edison with 12 MWh of stored energy and can be configured to deliver this power at 1 MW for 12 hours or 2 MW for 6 hours. The DESS RFP was competitively issued via the Company's Oracle System (September 2014), 9 vendor proposals were received (November 2014) and analysis of the proposals commenced.

Following an in-depth review, three shortlisted vendors were invited to present their solutions to the Company early January 2015. Following the vendor presentations, Con Edison

commenced and completed the technical evaluation of the proposals by February 2015. The results of the technical evaluation were submitted to the Company's Purchasing department for a financial evaluation of all solutions which technically met the requirements of the RFP.

Con Edison Purchasing is in the process of completing its financial review and has a target date for completion of April 2015. The Company expects to award a contract thereafter.

DC Link (MPI) Micro-grid

Con Edison is investigating alternative, cost-effective methods of load reduction utilizing the latest in distributed generation technologies. As part of this project Con Edison will be issuing an RFP for natural gas, alternative and renewable generation technologies to be combined with the deployment of the Company's existing Mobile Power Interface ("MPI" or "DC Link") along with a Mobile Electric Generator ("MEG"). Together, they can provide additional power to a local area as the need arises. The MPI and MEG trailers can be deployed for Area Network Support regardless of the contingency. For the BQDM project, they will be deployed at a Company location to provide approximately 1 to 2 MVA of area network load support even when all primary network feeders are in service (i.e., maximum possible available three-phase fault at the substation). In this, the Company expects that the MPI-MEG will interconnect to the Richmond Hill network via a dedicated Pad-Mounted 13.8kV / 208V transformer.

In addition to providing area network load support, the DC link system will be examined to test its ability to provide a micro-grid type solution that could support local loads in times of emergency.

The project will be deployed in two phases; phase one will involve the implementation of the DC Link system and phase two will involve the required system and grid modifications to enable micro-grid isolated operation. An RFP is being developed for release in the 4th quarter 2015 with an in service date of 2017.

Voltage Optimization

The purpose of the project is to optimize the voltage on the 27kV primary system including the 4kV overhead system by investigating enhanced, efficient voltage control. The Company estimates that approximately 7 MW of demand reduction can be achieved. A pilot program will commence in 2015; if successful the project is anticipated to enable 3 MW of load relief for summer 2016 and an additional 4 MW of load relief for summer 2017. An initial cost estimate has been established for this project.

For the 2015 pilot, voltage monitoring equipment, 4kV Unit Substation and Overhead equipment and SCADA equipment has been ordered. The voltage monitoring equipment will be installed and upgrades to the 4kV system and SCADA will commence during the second quarter of 2015.

The Company is investigating Measurement, Verification and Evaluation (MV&E) protocols for validation purposes and expects to have an MV&E contractor.

Utility Sided PV Pilot

The Photo-Voltaic ("PV") project is in the pre-RFP early stages. It attempts to investigate utility operated large PV located on Company owned premises at the Brownsville No.1 and Brownsville No.2 substations as well as at the Cleveland Street Work out location. Additionally, the project team is investigating the possibility of generating an aggregate of 1 MW by means of small PV devices installed on pole top mount configuration along utility poles in the BQDM area.

Challenges include engaging and incenting the large scale PV providers, determining the ownership and operation of the systems, and developing operating protocols. The Company, while recognizing the many challenges involved, has set an in-service target of Q2 2017.

Utility Sited Fuel Cell

Similar to storage solutions, the Company believes there are many benefits to utilizing fuel cell technology on the Company's system and. Through an RFP process, the Company will attempt to analyze the potential for this technology, ultimately identifying applications having the greatest potential value from the Company's perspective.

It is anticipated an RFP will be released during 2015 with a targeted project in service date of Q2 2017.

Community PV Pilot

The Community Photo-Voltaic ("PV") project was identified as a potential project in the previous quarterly report. The Company is no longer actively pursuing this solution as a result of utility distributed generation ownership restrictions outlined in the "Order on Rehearing and Clarification."⁷

Non-Traditional Utility-side Solutions Pipeline Activities

Con Edison is investigating additional projects that fall under the non-traditional utility-sided solution category. As these projects evolve more details will be provided in future quarterly reports. Most recently fuel cells and utility sided solar have moved from pipeline to RFP stage.

⁷ Case 14-E-0302, Order Granting Rehearing and Granting Clarification in Part (issued and effective April 20, 2015).