Martin F. Heslin
Assistant General Counsel

August 21, 2014
By Email for Electronic Filing

Honorable Kathleen H. Burgess
Secretary
State of New York Public Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

Re: Cases 13-E-0030, *et al*: Con Edison's Electric, Gas, and Steam Rates
Con Edison's Brownsville Load Area Plan

Dear Secretary Burgess:

In accordance with Ordering Clause 10 of the Public Service Commission's February 21, 2014 *Order Approving Electric, Gas and Steam Rate Plans in Accord with Joint Proposal*, Consolidated Edison Company of New York, Inc. hereby files its *Brownsville Load Area Plan*.

Very truly yours,

Attachment

C: Active Parties: Cases 13-E-0031, 13-G-0031, 13-G-0032 (email)

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Consolidated Edison Company of New York, Inc.

Brownsville Load Area Plan

Case 13-E-0030

August 21, 2014

Electric Operations Engineering and Planning

Table of Contents

Consolidated Edison Company of New York, Inc.

Brownsville Load Area Plan

I. INTRODUCTION

Electric load growth in Brooklyn and Queens, driven by demographic changes and building construction, is increasing significantly. This growth poses a challenge for the electric infrastructure, particularly area substations that supply power to meet customer demand. As electric demand in a load area increases, the margin between area substation capability and the peak demand decreases.

In 2013, Consolidated Edison Company of New York, Inc., ("Con Edison" or "the Company") determined that rapid load growth in northeastern Brooklyn and southwestern Queens would cause projected 2014 peak demand to exceed the capability of the 138 kV supply feeders to the Company's Brownsville No. 1 and Brownsville No. 2 area substations that supply this load area ("Brownsville load area"). In response, Con Edison is implementing short-term operational measures that increase substation capability and will meet projected peak demands and maintain reliable electric service in the Brownsville load area during 2014 and 2015.

Because peak demands in the Brownsville load area will continue to increase, longer-term, sustainable measures are required to meet peak loads in the Brownsville load area. Con Edison's *Brownsville Load Area Plan* presents the Company's long-term plan to develop and implement such measures.

A. Procedural Background

In Con Edison's recent electric rate case, the Company and the parties recognized that planning for these longer-term measures must occur during the two-year term of the rate plan

that has been established in that proceeding. The parties also recognized that the Public Service Commission ("Commission") was planning a comprehensive inquiry into the deployment of distributed energy resources to efficiently address load growth.[1] Accordingly, the Joint Proposal submitted to the Commission stated that Con Edison would consider the deployment of distributed energy resources in developing plans to meet load growth in the Brownsville load area. The Joint Proposal stated:[2]

> To the extent practical, the Company will utilize non-traditional programs that facilitate use of distributed resources to reduce the identified investment needs. The nature of the programs that may be utilized by the Company will seek to further the deployment of advanced technologies, and could include utility and customer-side resources. The Company will meet with Signatory Parties before implementation to discuss the contemplated solutions, providing sufficiently detailed technical and cost information as to its analysis and proposed solutions so that interested Signatory Parties can meaningfully evaluate the Company's proposed solutions and provide feedback.

The Commission's *Order Approving Electric, Gas and Steam Rate Plans in Accord with Joint Proposal*, issued February 21, 2014 in Cases 13-E-0030, *et al.* ("2104 Rate Order"), noted that "Con Edison will pursue a plan to address significant load growth in the Brownsville section of Brooklyn with distributed resources as an alternative to traditional infrastructure."[3] The 2014 Rate Order directed the Company to file with the Commission within six months, i.e., by August 21, 2014, "an implementation plan with respect to the Brownsville, Brooklyn network solution."[4]

[1] On April 25, 2014, the Public Service Commission established a proceeding to "consider a substantial transformation of electric utility practices to improve system efficiency, empower customer choice, and encourage greater penetration of clean generation and efficiency technologies." Case 14-M-0101 (Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision), "*Order Instituting Proceeding*," April 25, 2014, p. 5.
[2] Cases 13-E-0030, *et al*. (Con Edison Electric, Gas and Steam Rates), *Order Approving Electric, Gas and Steam Rate Plans in Accord with Joint Proposal,* February 21, 2014, Appendix C, p. 38.
[3] 2014 Rate Order, pp. 4, 16.
[4] Id. 75.

B. Collaborative Discussions

Con Edison engaged interested rate parties in collaborative discussions regarding the development of the Company's *Brownsville Load Area Plan*. Con Edison convened an initial meeting with the parties on April 28, 2014. At this meeting, which took place at the Commission's New York City office, the Company made an extensive presentation on the potential traditional and non-traditional customer and utility-side options that the Company had identified and was considering. The presentation examined:

- the nature and scope of the projected substation capacity deficiency,
- Brownsville area load characteristics, including load curve and customer characteristics,
- Brownsville load area demographics, such as population and housing growth and ownership and renter statistics,
- analytical tools for identifying and targeting energy efficiency and demand response opportunities, and
- a portfolio of customer-side and utility-side options, including potential megawatt contribution and cost.

The Company circulated slides of its presentation in advance, and the Company and parties engaged in a robust exchange of ideas throughout the meeting.[5]

[5] In advance of the meeting, Con Edison also circulated to all parties the following background information:
- A load area map with zip codes and neighborhoods
- Customer segmentation data by type, account counts, annualized consumption, demand and kVA
- Historical and projected peak demand load curves
- Projected substation overloads by year through 2023
- Demographic change data (population, household, housing units)
- Marginal cost of energy 2011 – 2013
- Current customer participation in peak load shifting programs
- Energy efficiency participation (customer count by program and kWh/kW savings)
- Installed and planned distributed generation capacity by DG type
- Potential customer-side distributed energy measures by type, MW potential and cost.

Con Edison met with the parties on June 19, 2014 to present and discuss its proposed plan for meeting long-term load growth in the Brownsville load area. The meeting, which was held at Con Edison's office (4 Irving Place in Manhattan) and accessible by WebEx, outlined the Company's plan, discussed in detail in the sections below, comprised of non-traditional customer-side and utility-side resources and traditional utility infrastructure resources. The Company presented its plan to obtain 41 MW in customer-side solutions between 2016 and 2018 through a combination of distributed generation, demand management, energy efficiency, and potentially other innovative solutions to be proposed and implemented by multiple providers. The Company discussed its extensive preparatory work and an initial 100-day plan encompassing a variety of initiatives to engage customers and energy services market providers in producing these solutions. The Company also outlined its plan to develop 11 MW of non-traditional utility side solutions between 2016 and 2018, including battery-storage microgrids, large apartment-complex microgrids, and a DC Link-enabled microgrid, as well as other solutions, such as volt/VAR optimization. The Company outlined its plan for establishing traditional infrastructure solutions between 2016 and 2019. The Company also discussed its projected cash flows from 2014 through 2019 to implement these solutions.

II. BROWNSVILLE LOAD AREA CHALLENGE

A. Brownsville Load Area

The Brownsville load area consists of the following components of Con Edison's electric distribution system: the Crown Heights, Ridgewood and Richmond Hill underground networks, non-network (4kV overhead) load areas, and a portion of the JFK Airport load.[6] The Brownsville load area is supplied from the Brownsville No. 1 area substation and the Brownsville No. 2 area substation (collectively "the Brownsville substations"). Brownsville No.

[6] An overview of Con Edison's electric system is provided on Appendix A – Con Edison Electric System Overview.

1 supplies the Crown Heights network and the Ridgewood network, both located in Brooklyn. Brownsville No. 2 supplies the Richmond Hill network and non-network load areas, which are located partially in Brooklyn and partially in Queens, and a portion of JFK Airport, which is located in Queens.[7] The Brownsville substations are separate, indoor, totally enclosed area substations located at a site in Brooklyn that is relatively central to the three networks. Figure 1 shows the location of the Crown Heights and Ridgewood networks and the Richmond Hill network and non-network load areas.

Figure 1: Location of the Crown Heights, Ridgewood, and Richmond Hill networks

[7] The Brownsville load area includes all or parts of the following neighborhoods in north central and eastern Brooklyn: Greenpoint, East Williamsburg, Bushwick, Bedford-Stuyvesant, Crown Heights, East Flatbush, Brownsville, and East New York, and all or parts of the following neighborhoods in southwestern Queens: Richmond Hill, Howard Beach, Broad Channel, Ozone Park, South Ozone Park, Woodhaven and Kew Gardens.

B. Brownsville Substation Sub-Transmission Feeder Overload

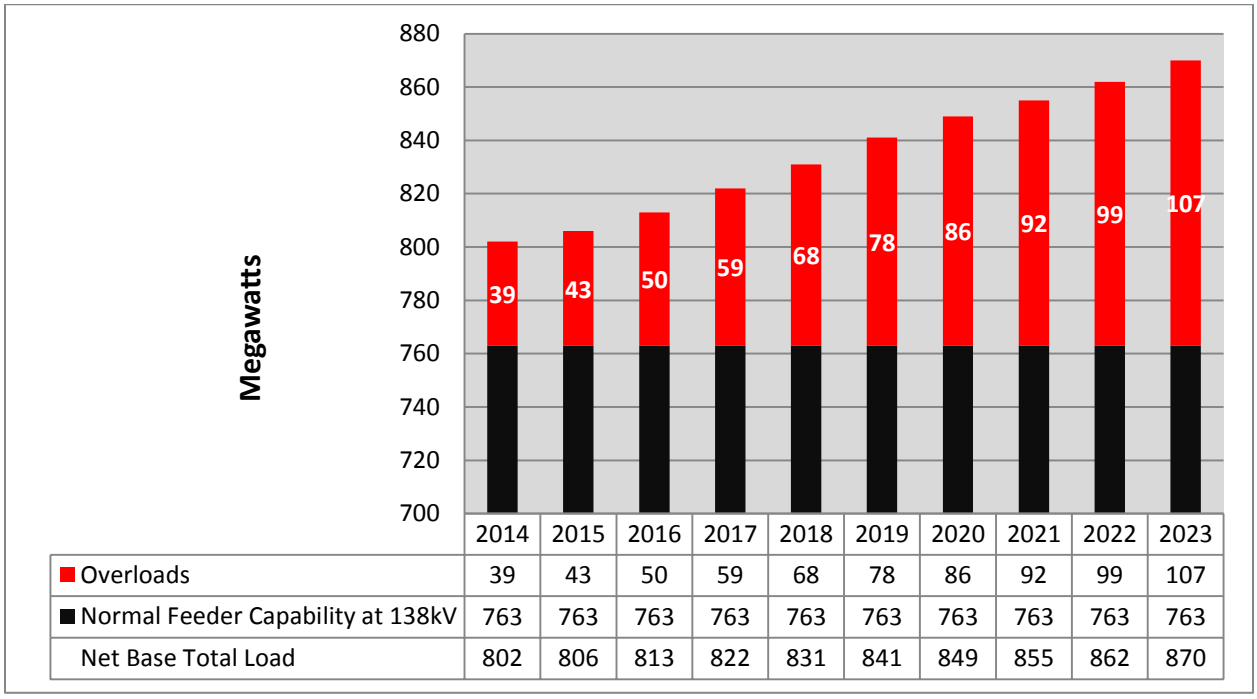
The Brownsville substations are supplied by a set of five 138,000 volt ("138 kV") sub-transmission feeders that originate at the Farragut 345 kV transmission switching station ("Farragut") located in Brooklyn. ("Brownsville sub-transmission feeders")[8] Four sub-transmission feeders are connected to load, and one is maintained as a stand-by in order to meet reliability requirements.[9]

The capacity of the four sub-transmission feeders supplying the Brownsville substations is 763 megawatts ("MWs"). In 2013, the actual peak load demand on the Brownsville sub-transmission feeders from the Brownsville load area reached 785 MWs. At that time, Con Edison had projected that the peak load would not reach that level until 2019.

Following the summer of 2013, Con Edison's analysis of the Brownsville load area growth concluded that the 2013 Brownsville peak demand adjusted for summer weather was 794 MW and that the peak load demand on the Brownsville sub-transmission feeders in 2014 is projected to be 802 MW, resulting in a sub-transmission feeder overload of 39 MW. Due to continued expected growth in customer demand, the overload on the sub-transmission feeders is projected to increase each year over the next ten years and reach 107 MW in 2023. See figure 2: Brownsville Load Area Challenge.

[8] The same set of five 138 kV feeders supplies both Brownsville No. 1 and Brownsville No. 2 substations. Transformers at each substation reduce the voltage from 138 kV to 27 kV. The energy is transmitted through 27 kV feeders from the substations to the networks and non-network load areas where transformers reduce the voltage to customer usage levels. See Appendix A.

[9] Area substations must be designed to anticipate the loss of supply from a source sub-transmission feeder. Accepted industry practice is to provide adequate sub-transmission source capacity to withstand the loss of one sub-transmission feeder source at the time of peak demand. This is called "first contingency" design.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Overloads	39	43	50	59	68	78	86	92	99	107
Normal Feeder Capability at 138kV	763	763	763	763	763	763	763	763	763	763
Net Base Total Load	802	806	813	822	831	841	849	855	862	870

Figure 2: Brownsville Load Area Challenge

The Ridgewood and Crown Heights networks and the Richmond Hill network and non-network load areas supplied by the Brownsville substations have and are currently experiencing notable demographic and building changes. Since 2000, these networks have experienced significant growth in the number of households. Demographic forecasting indicates that household growth will continue. Construction forecasts also indicate that the area will experience notable residential and commercial construction activity. The Richmond Hill and Crown Heights community districts approved substantial rezoning which will further encourage development in the networks.

These factors are directly associated with an increase in electric demand. Figure 3 shows the projected peak demand in the Brownsville load area in relation to sub-transmission feeder capability in 2018 and 2023

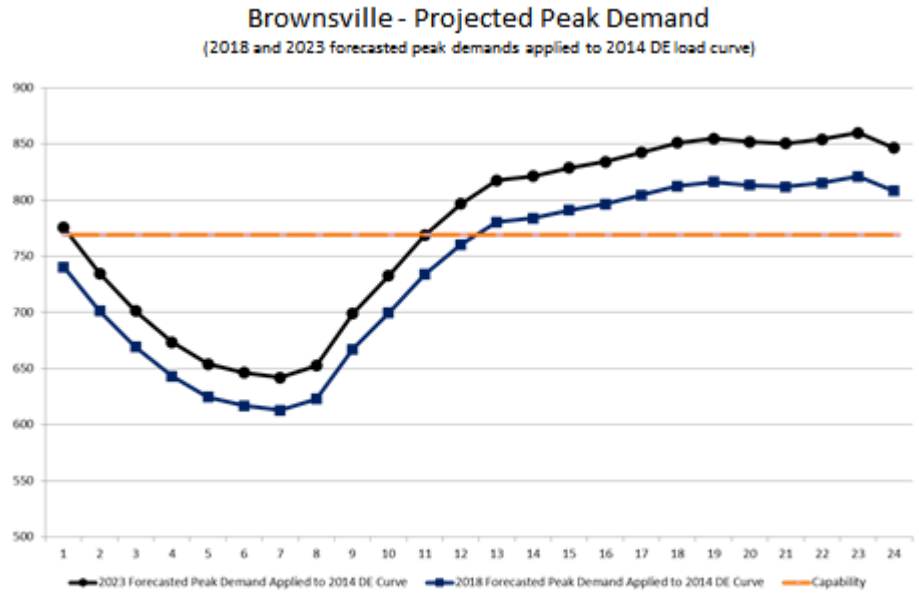


Figure 3: Brownsville Projected Peak 2018 and 2023 Demand

III. BROWNSVILLE LOAD RELIEF PLAN

A. The Traditional Solution

The traditional solution to address the overload in the Brownsville load area would be the transfer of load to adjacent load areas that are supplied by area substations that have spare capacity to supply the transferred load. That option is limited to a transfer of about 11 MW to the Maspeth and Williamsburg load areas because adjacent area substations are approaching full capacity considering projected load growth in those areas. The remaining traditional solution is an infrastructure project to build a new area substation to supply a portion of the Brownsville load area. The project would include: 1) the expansion of Gowanus 345 kV switching station into a new 345/138kV step-down station to accommodate new sub-transmission feeder supplies for a new area substation and 2) construction of an area substation and new sub-transmission

feeders that would have been constructed and in service by the summer of 2017 (collectively the "New Substation/Gowanus Package"). The New Substation would be built within the load area served by the Brownsville substations. A preliminary location has been identified; however, the Company does not currently own land for the New Substation. The preliminary order of magnitude cost estimate of the New Substation/Gowanus Package is around $1 billion. This is based on the preliminarily identified location for the area substation. Purchase of the property would be the first step to build the New Substation/Gowanus Package; finalizing the location determines the length of the new sub-transmission feeders from Gowanus and the final substation layout which will impact the costs of the New Substation/Gowanus package.

The New Substation would supply a substantial portion of the customer load currently supplied from the Brownsville substations and would thereby relieve the projected overload of the Brownsville sub-transmission feeders for the foreseeable future. In addition, the New Substation would have capacity to relieve the Bensonhurst load area where projected customer load growth over the next ten years is also projected to exceed the capability of the 138 kV sub-transmission feeders supplying the Bensonhurst No.1 and No.2 area substations. Figure 4 below shows the projected load growth in Brooklyn and Queens load areas from 2014 through 2023.[10]

[10] The current loading on Brooklyn and Queens area substations is as follows:

Station Loading – Brooklyn

- Greenwood – 96%
- Bensonhurst 1 – 94%
- Bensonhurst 2 – 94%
- Plymouth St. – 92%
- Water St. 89%

Station Loading – Queens

- Jamaica – 94%
- Corona 2 – 94%
- Glendale – 94%
- Newtown – 94%
- Corona 1 – 81%
- North Queens – 48%

The last area substation built in Brooklyn was the Water Street substation in 1989.

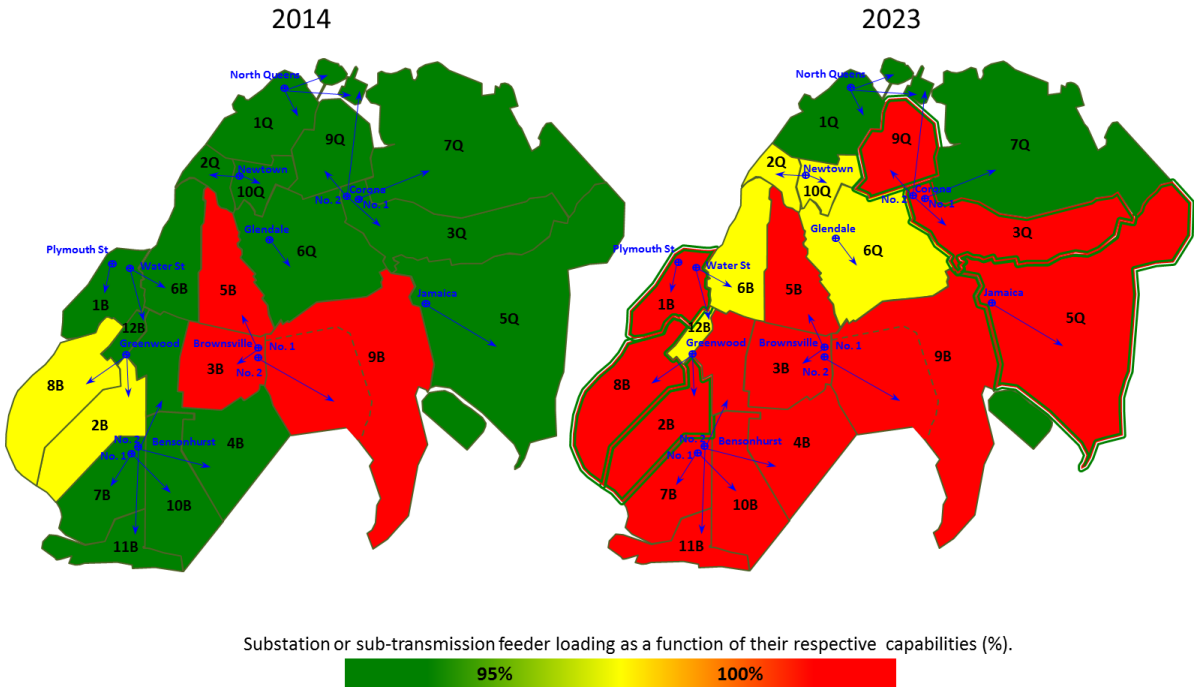


Figure 4: Projected Load Growth in Brooklyn and Queens

B. Plan to Defer the Traditional Solution -- Overview

Con Edison has developed and plans to implement a program that will defer the New Substation/Gowanus Package from 2017 to at least 2024 while meeting the projected load growth in the Brownsville load area. The program consists of several components:

- Operational measures,
- Traditional utility infrastructure measures,
- Non-traditional customer-side measures, and
- Non-traditional utility-side measures.

The operational measures, described in Section C. 1, *infra*, will temporarily increase the MW capability of the Brownsville sub-transmission feeders from 2014 until other measures are in place by summer 2016 to accommodate increasing customer demand.

Utility infrastructure measures, described in Section C. 2, *infra*, will (a) transfer 11 MW of customer load from the Brownsville load area to the load areas that are supplied by the Glendale and Water Street area substations and (b) install capacitors to increase the capability of the Brownsville sub-transmission feeders by 6 MW by summer 2016.

The non-traditional customer-side measures, described in Section D, *infra*, will utilize a variety of measures on customer property and behind the customer's meter to reduce customer peak demand in the Brownsville load area by approximately 41MW. The Company plans to consider a number of different options for non-traditional customer-side solutions, including energy efficiency, demand management, demand response, distributed generation, and energy storage technologies. Deployment of these measures will begin in 2014 and be fully deployed by summer 2018.

The non-traditional utility-side measures, described in Section D, *infra*, will include approximately 11 MW of distributed energy technologies that will offset the peak demand in the Brownsville load area. Potential technologies include large-scale electricity storage/microgrids at the utility level; large apartment-complex microgrids; a generator and DC link at the Brownsville substations; Volt/Var Optimization, and a Distribution Management System. These measures will be deployed beginning in 2016 and be fully implemented by summer 2018.

Subsequent utility infrastructure measures, described in Section E, *infra*, will include installation of a fifth transformer at the Glendale area substation and a fourth transformer at the Newtown area substation and the associated sub transmission feeder to increase the capacity of

those substations and of their common sub-transmission supply feeders. The increased capacity will allow Con Edison to transfer 80 MW of load from the Brownsville load area to the load area supplied from the Glendale area substation by summer 2019.

The non-traditional customer-side (41 MW) and utility-side (11 MW) measures, which Con Edison calls the Brooklyn/Queens Demand Management ("BQDM") Program, together with 17 MW of utility-infrastructure solutions (11 MW load transfer and the equivalent of 6 MW in reactive capacitor installation) will defer the in-service date of the New Substation/Gowanus Package from 2017 to 2019. The installation of the additional transformers at Glendale and Newtown area substations and the 80 MW load transfer from Brownsville to Glendale will further defer the in-service date of the New Substation/Gowanus Package from 2019 to at least 2024. Additional customer-side solutions during this period could potentially defer construction beyond 2024.

The following sections provide details regarding the various components of Con Edison's Brownsville Load Relief Plan

C. Utility Measures To Address Brownsville Sub-Transmission Feeder Overload: 2014 To 2016

1. Operational Measures

The normal total capability of the four sub-transmission feeders supplying the Brownsville substations is 763 MW. From 2014 through 2016, Con Edison plans to utilize operating measures to temporarily increase the capability of these feeders. In 2014 and 2015, Con Edison will operate the 138 kV sub-transmission feeders at a higher operating voltage of 143 kV to increase feeder capability by 27 MW and will utilize special feeder ratings to achieve an additional increase in feeder capability by 20 MW, totaling in 47 MW of additional capability.

These operational measures will increase sub-transmission feeder capability to 810 MWs to meet the projected peak load of 802 MWs in 2014 and 806 MWs in 2015.[11]

In 2016, Con Edison plans to operate the sub-transmission feeders at 142 kV to increase feeder capability by 22 MW to 785 MW. To meet the projected load of 813 MW in 2016, additional solutions to relieve overloading on the Brownsville sub-transmission feeders are necessary. These solutions are a combination of utility infrastructure measures and non-traditional customer-side measures discussed in the following sections.

2. Infrastructure Measures

In 2016, Con Edison plans to install additional capacitor banks at the Brownsville substations or at the 4 kV grids to achieve an additional 6 MW of sub-transmission feeder capability to an aggregate 791 MW. In addition, the Company will transfer 11 MW of load from the Brownsville load area to adjacent load areas supplied from the Glendale and Water Street area substations. This load transfer will be performed in advance of the 2016 summer peak load season and will reduce the 2016 projected peak load on the Brownsville sub-transmission feeders from 813 MW to 802 MW.[12]

With these infrastructure measures, approximately 9 MW of non-traditional customer-side solutions plus 2 MWs of non-traditional utility side solutions will be needed to meet the 2016 peak load. These customer-side and utility side solutions are discussed below.[13]

[11] These operational measures entail negligible cost but can only be deployed on a temporary basis since the Company does not design or operate the system to meet load growth/demand by using operational measures. Operational measures are used only for emergencies or unplanned growth that cannot be met in time by engineered solutions.

[12] The estimated cost to install 6MW capacitor capacity is about $ 4.5 million. The estimated cost to transfer 11 MW to Glendale and Water Street load areas is about $ 8.7 million.

[13] The deployment of these customer-side solutions in 2016 allows the Company to reduce its reliance on operational measures to increase Brownsville sub-transmission feeder capability.

D. Non-Traditional Customer And Utility Side Solutions To Address The Brownsville Sub-Transmission Feeder Overload: 2016 To 2018

Following 2016, Con Edison will no longer operate the Brownsville sub-transmission feeders above 138kV, and through 2023, the capability of the sub-transmission feeders will be 769 MW, including the 6 MW capacity obtained from the capacitor installation. As shown in Figure 2 (page 2), the projected peak load from 2017 through 2023 will increase each year from 822 MWs to 870 MWs creating potential overloads that increase from 50MW to 107 MW. Consequently, additional solutions will be required to address the Brownsville sub-transmission feeder overloads.[14] Con Edison's BQDM Program, discussed below, will contribute approximately 52 MW to address the sub-transmission feeder overloads through 2018 and will help to defer the New Substation/Gowanus Package to 2019.

1. The Brooklyn /Queens Demand Management Program: 2016 to 2018

Con Edison's BQDM Program seeks to implement 52 MW of non-traditional customer-side solutions and utility-side solutions by summer 2018 to relieve the Brownsville sub-transmission feeder overloads in order to support deferral of the New Substation/Gowanus Package from 2017 to 2019.[15] The BQDM Program implements Con Edison's commitment in its Rate Plan as follows:

> To the extent practical, the Company will utilize non-traditional programs that facilitate use of distributed resources to reduce the identified investment needs [to address peak demand growth in the Brownsville Load area]. The nature of the programs that may be utilized by the Company will seek to further the deployment of advanced technologies, and could include utility and customer-side resources.

[14] Beginning in 2016, the 11 MW load transfer to the Glendale and Water Street load areas will reduce peak load by 11 MW from the Net Base Total Load shown in Figure 2.

[15] Con Edison currently plans 41 MW of non-traditional customer-side and 11 MW of non-traditional utility-side measures. However, the mix of customer- and utility-sided solutions may vary. The Company's plan anticipates approximately three-quarters of the reduction would come from the customer-side, typically deployed on customer property and behind the customer's meter, and the remainder from the utility-side, directly connected to the distribution network.

The BQDM Program also embodies the goals of the Commission's Reforming the Energy Vision ("REV") proceeding[16] by incorporating both customer-side and utility-side solutions in a program designed to engage customers and to help meet system planning criteria by relying on distributed energy resources as an alternative to more traditional utility solutions. In addition to providing the demand reduction required in Brooklyn/Queens to permit deferring construction of traditional utility assets, the BQDM Program will provide an important opportunity for stakeholders to learn from an effective test of REV ambitions. The Company's more robust utility reliance on a set of assets and other solutions that can defer peak electricity needs will inform all stakeholders, while allowing the Company to gain a more informed perspective of its ability to rely on such assets. Further, customers that choose to participate may also be able to gain additional benefits by managing their own energy usage.

On July 15, 2014, Con Edison filed with the Commission a petition for approval of the BQDM Program ("BQDM Petition").[17] The BQDM Petition discusses the BQDM Program in detail and is incorporated by reference into Con Edison Plan for Brownsville Load Relief as presented herein.

a) Non-traditional customer-side solutions

As stated in the BQDM Petition, the Company plans to consider the following variety of options for non-traditional customer-side solutions to reduce customer peak demand in the Brownsville load area by approximately 41MW.[18]

- Customer-Sided Energy Efficiency that is targeted to reduce base demand of buildings, which may include measures addressing building envelope, lighting,

[16] Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, *Order Instituting Proceeding*, issued April 25, 2014.
[17] Case 14-E-0302 "Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn/Queens Demand Management Program." A copy of the petition is attached in Appendix B - Brooklyn-Queens Demand Management Program Petition.
[18] These measures will be deployed beginning in 2014 and will be fully deployed by summer 2018.

central and room air conditioning, refrigerator replacement, and white roofs. Appropriately targeted energy efficiency will produce long-duration demand reduction that can also reduce customer energy use both during network peak hours and outside of the peak hours.

- Demand Management that may include measures such as integrated controls (building management and energy management systems), daylight harvesting, storage (battery and thermal), demand response, and automated demand response.
- Distributed Generation that may include facilities that serve base load, such as combined heat and power, standby load, *e.g.*, fossil fuel-fired generation, and, to the extent feasible, distributed renewable energy sources.
- Other Innovative Solutions that may include retro-commissioning projects, microgrids, new building designs for natural lighting, and passive climate control projects.

The BQDM Program will provide flexibility and allow the Company to bring technologies to the distribution system directly, to enable a more robust set of resources and system-management tools as an alternative to traditional investment, while furthering the REV learning process. The BQDM Program will include an interactive two-way demand management program with increasing use of controllable Distributed Energy Resources. The BQDM Program will seek multiple solution providers so that multiple approaches and technologies can be evaluated to determine the best aggregate solutions. The Company will be acting as the aggregator of a variety of solutions, taking on a more proactive management and implementation

role.[19] The BQDM Program proposes, in part for the REV learning experience, a combination of complex and evolving technologies with which the Company, and end-use customers, have varying levels of experience and confidence. Achievement of the BQDM goals will require the development of new strategies and customer engagement and education efforts.

b) Non-traditional utility-side solutions

Con Edison will develop 11 MW of non-traditional solutions that leverage distributed energy technologies, alternative business arrangement models, and innovative equipment configurations in the network and non-networked load areas supplied from the Brownsville substations. The Company will develop and demonstrate technologies and models that will enable the distributed energy future, can be replicated to address increasing customer demand elsewhere, will engage third parties, and will leverage other financial resources. The Company plans to consider the following variety of different options for non-traditional utility-side solutions:[20]

Distribution Engineering Storage Solution – The Company plans to seek distribution engineering storage solutions ("DESS") for two separate functional options through a request for proposal. The two options would be for one and two MW of power for 12 hours of continuous use. The batteries could be sited at the Company's unit substations for ease of deployment, but other locations will also be considered. Systems could be designed at one location or across several locations and would be managed remotely by the Company's Demand Management

[19] The use of non-traditional resources to address the overload in the Brownsville load area is made more complicated by its very long (12-hour) daily peak load, which occurs from noon to midnight. The 12-hour peak is comprised of both commercial and residential demand. See Figure 3.
[20] These measures will be deployed beginning in 2016 and will be fully deployed by summer 2018.

System ("DMS") to follow an automatic schedule that could be overridden as required by system conditions or contingencies.[21]

Apartment Complex Microgrid – The Company will work with apartment complexes within Brooklyn/Queens to determine the feasibility of developing one or more microgrids that could be owned by the Company, the customer, or another party. The Company will require remote operating capability from its Control Center to control the unit's output.

Generation and DC Link – The Company will establish a synchronous generation source at the Brownsville substations to feed through a DC link into the secondary grid. The DC link provides the ability to limit fault current contributions from the generator, ride through voltage sags or rapid load changes without tripping the generator, and detect and disconnect islanded systems.

Volt/Var Optimization – The Company will examine the possibility of installing voltage sensors and communications equipment on pole-mounted transformers in the 4 kV grid in the Richmond Hill non-network load areas. The information communicated from these sensors will be leveraged as a feedback loop for volt/var optimization within the 4 kV grid. A voltage reduction of 2.25% would provide 2 MW of demand reduction, and the customers in the grid would experience year-round energy savings of about two percent.

Distribution Management System – The above measures on the 4 kV grid will be managed via a DMS demonstration. The DMS will control tap changers at the 10 unit substations for volt/var optimization, the batteries described in the DESS above, the turbines at any apartment complex described above, and the generation incorporated with the DC Link

[21] As the Company develops expertise and additional battery projects, it may use its expertise in battery installation and battery maintenance to further encourage such solutions in the future, including at the customer-side.

described above. The DMS will incorporate feedback from voltage sensors to determine optimal settings of all equipment.

c) Request for information to engage third-party market participation in the BQDM Program

To engage third-party market participants in the BQDM Program, Con Edison has issued a Request for Information ("RFI") asking for their input into how the non-traditional customer-side and utility-side solutions should be constructed.[22] The RFI, which will be one approach in a portfolio of complimentary approaches to the area's overload, is constructed to attract the broadest range of potential solutions. The RFI is an open solicitation that will provide a framework to identify a wide range of both well-established and new innovative opportunities. Solutions will be selected using a matrix-based evaluation with high-confidence, low-cost solutions balanced with newer, higher-cost developing solutions that are more aligned with broader policy objectives, but have not necessarily been tested in the marketplace. The Company hopes to identify solutions through the RFI that can commence contracting, if appropriate, as early as the fourth quarter of 2014.

E. Utility Infrastructure Measures To Address Brownsville Sub-Transmission Feeder Overload: 2019 To 2023

In 2019, Con Edison forecasts that the combination of traditional infrastructure solutions and non-traditional utility and customer side solutions will mitigate approximately 40 MW of the projected 78 MW overload on the Brownsville sub-transmission feeders.[23] The projected overload will increase to 107 MW by 2023.

[22] http://www.coned.com/energyefficiency/competitive_solutions_opportunities.asp

[23] See figure 5, *infra*. For forecasting purposes, Con Edison assumes that 12 MW of the customer-side energy-efficiency base-demand reductions implemented from 2014 through 2018 will continue as long-duration demand reductions and that non-traditional customer-side solutions alone will not be adequate to mitigate the balance of the overload.

To address this increasing overload from 2019 through 2023, Con Edison will install an additional (fifth) transformer at the Glendale area substation and additional (fourth) transformer at the Newtown area substation and the associated sub transmission feeder. These transformers will increase the capacity of those substations to allow for the transfer of 80 MW of load from the Brownsville load area to the load area supplied from the Glendale area substation by summer 2019. The installation of transformers at Glendale and Newtown area substations and the 80 MW load transfer leverage existing infrastructure to further defer the in-service date of the New Substation/Gowanus Package from 2019 to at least 2024.[24] Additional customer-side solutions during this period, combined with the 80 MW load transfer, could potentially defer the in-service date beyond 2024.

F. Summary Tables

The annual contribution of each component of Con Edison's *Brownsville Load Area Plan* to the relief of the projected Brownsville sub-transmission feeder overloads is shown in Figure 5.

[24] The estimated cost to establish the Newtown and Glendale transformers in 2019 is about $290 million. The estimated cost of the 80MW load transfer from the Brownsville load area to the Glendale load area is $60 million.

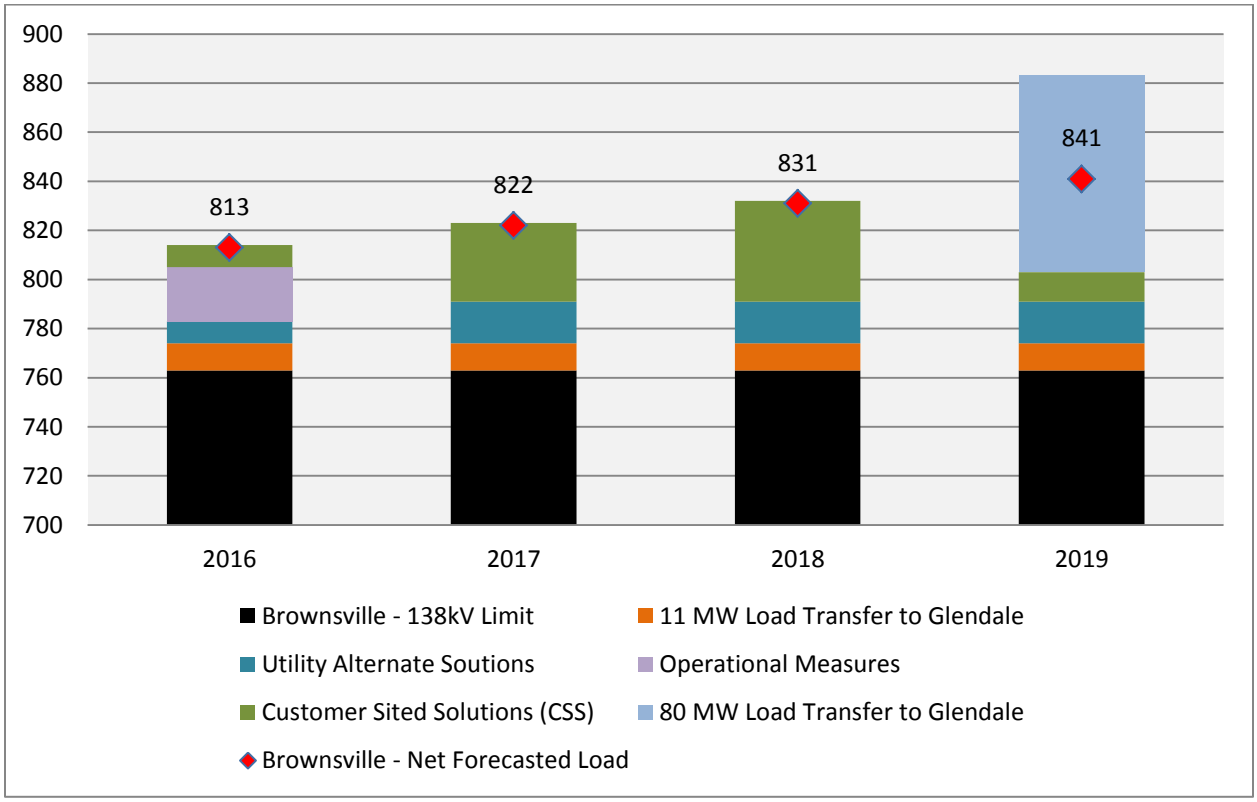


Figure 5: Brownsville Load Area Plan by Component: 2016-2019

The projected annual cash flows to implement Con Edison's *Brownsville Load Area Plan* are shown in Figure 6.

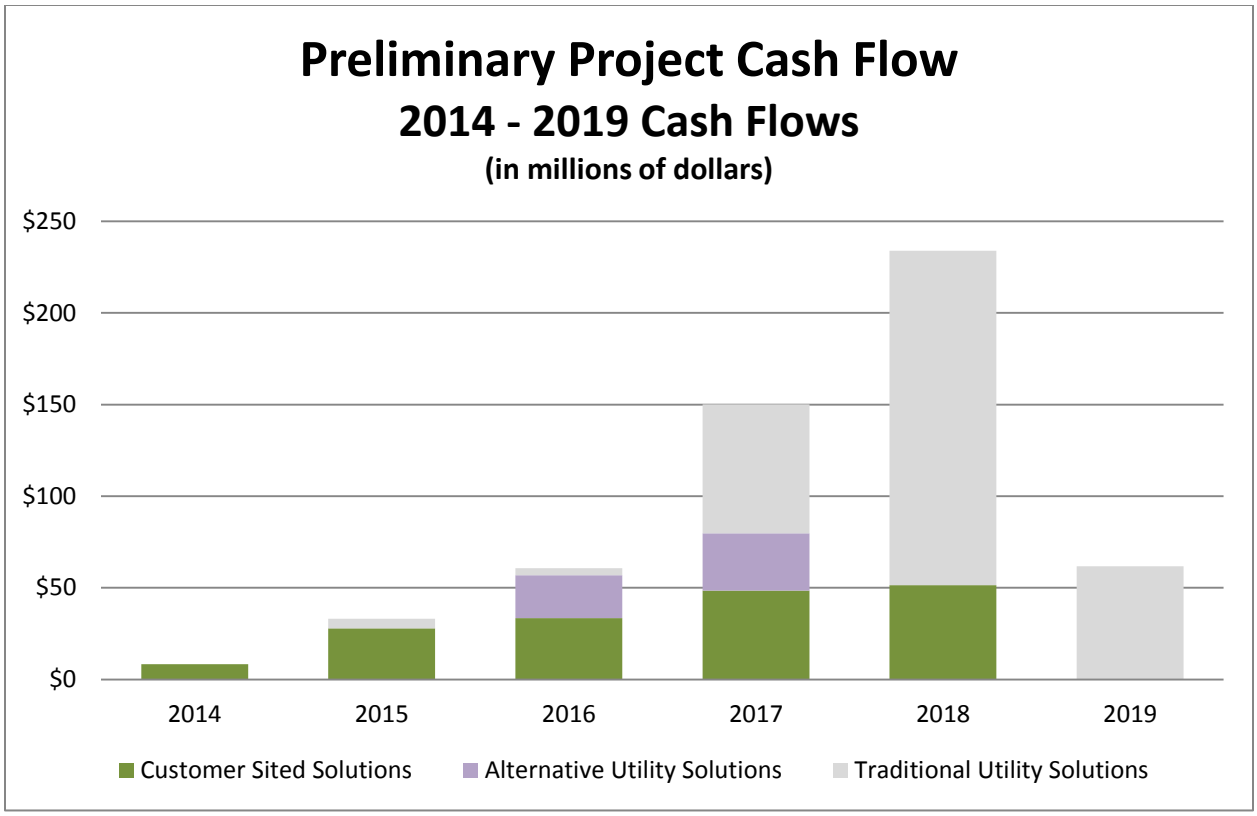


Figure 6: Brownsville Load Area Plan Preliminary Cash Flows: 2014-2019

IV. CONCLUSION

Con Edison's *Brownsville Load Area Plan* is intended to defer a major capital expenditure – the New Substation/Gowanus Package – while allowing time, in alignment with the goals of the Commission's Reforming the Energy Vision proceeding, to gain experience and understanding of customer-side market potential and to assess new technologies for distributed customer resources and for non-conventional utility supply side resources.

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Consolidated Edison Company of New York, Inc.

Electric Operations Engineering and Planning