BENEFIT COST ANALYSIS: NEWTOWN NON-WIRES SOLUTIONS PROJECT

June 2020

Prepared by Consolidated Edison Company of New York, Inc.

Table of Contents

Overview

Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") commenced implementing the 21.7 MW Newtown Non-Wires Solutions ("NWS") Project ("Newtown") to alleviate projected overloads at the Newtown area substation and the sub-transmission feeders serving the Newtown and Glendale area substations.[1] The overloads were projected to start in the summer of 2021 and generally increase year-over-year within the 10-year horizon. This NWS defers the need for a traditional utility infrastructure project, a load transfer project, detailed in Appendix A, to alleviate the projected overloads through the summer of 2024.

This filing provides the Benefit Cost Analysis ("BCA") results for the NWS and is made at this time because the Company has reasonable certainty related to the costs to implement the NWS portfolio.[2] The Company issued two Request For Proposals ("RFP") to solicit resources for this project and developed a combined portfolio of energy efficiency and energy storage resources to meet the projected infrastructure need. Based on this portfolio, the Newtown NWS Project generates $16.8 million in net benefits for customers and achieves a societal cost test score of 1.34, demonstrating a

[1] Case 16-E-0060, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service,* NWS Q4 2019 Report (filed February 28, 2020).
[2] The New York State Public Service Commission ("PSC" or "Commission") issued its *Order Approving Shareholder Incentives* ("Incentives Order"), requiring, inter alia, that Con Edison's Targeted Demand Management Program end on January 25, 2017, (Case 15-E-0229, Petition of Consolidated Edison Company of New York, Inc. for Implementation of Projects and Programs that Support Reforming the Energy Vision, *Order Approving Shareholder Incentives* ("Incentives Order") (issued January 25, 2017), p. 9). Henceforth, any NWS projects were to be completed under the NWS provisions of the rate plan adopted in the Con Edison Rate Case order ("Rate Case Order") issued on the same date. (Case-16-E-0060, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service, *Order Approving Electric and Gas Rate Plans* (issued January 25, 2017). This methodology was continued in the subsequent rate plan ("Second Rate Case Order") (Case 19-E-0065, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service. *Order Adopting Terms of Joint Proposal and Establishing Electric and Gas Rate Plan* (issued January 16, 2020). The Incentives Order also provides a methodology for determining incentives that applies to large as well as small NWS projects under the NWS framework approved in the Rate Case Order and the Second Rate Case Order.

robust and beneficial set of solutions that will provide a viable alternative to a traditional infrastructure approach through summer 2024.

The Company signed contracts with the third-party resources for solutions and has expanded its energy efficiency offerings in the geographic area served by the NWS. The Company expects that the resources will be available in time to meet the projected load relief needs.

Background

In 2018, the Company first identified that projected loads on the Newtown area substation and the sub-transmission feeders supplying both Newtown and Glendale area stations would exceed the infrastructure's capabilities beginning in summer 2022, which was updated in 2019 to be a summer 2021 need. Figure 1 illustrates the geographic area affected by the projected infrastructure overload.

Figure 1: Map of the Newtown NWS Geographic Area

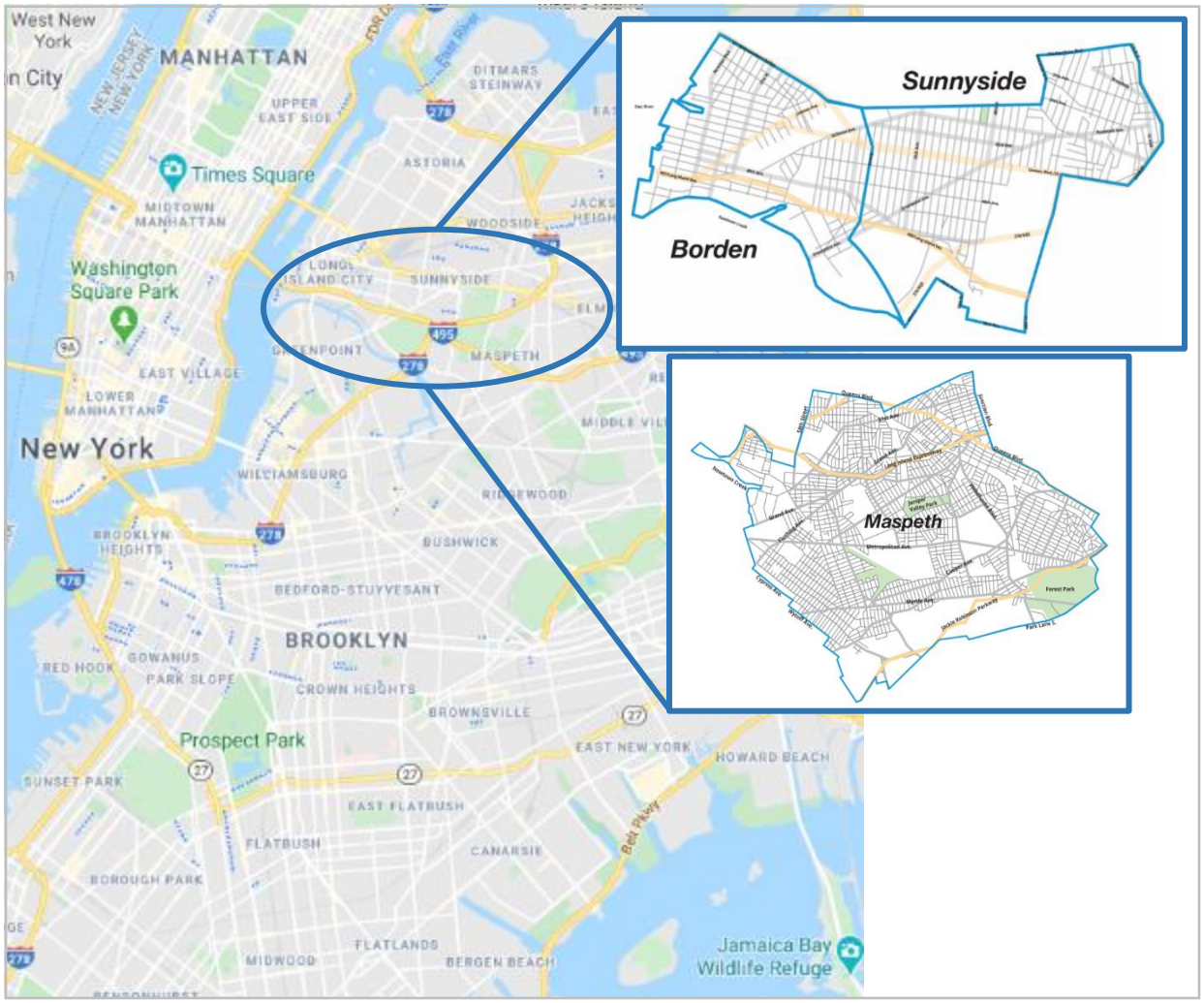


Table 1 below shows the combined year-over-year projected overloads at the Newtown substation and on the sub-transmission feeders based on the 2019 load forecast.

Table 1: Projected Incremental Yearly Overloads (MW) on Newtown substation and Vernon-Glendale Sub-transmission feeder

2021	2022	2023	2024	2025	2026	2027	2028	Total
9	10	0	2	9	5	5	4	**44**

The Company designed a traditional solution to alleviate the anticipated substation and sub-transmission feeder constraints consisting of a 40 MW load transfer from the Newtown substation to the North Queens substation, described in Appendix A. As part of the planning process to address this need, however, the Company determined that the load relief need and timeline for the traditional solution met NWS suitability criteria, and subsequently initiated market solicitations for distributed energy resources to meet the anticipated overloads.

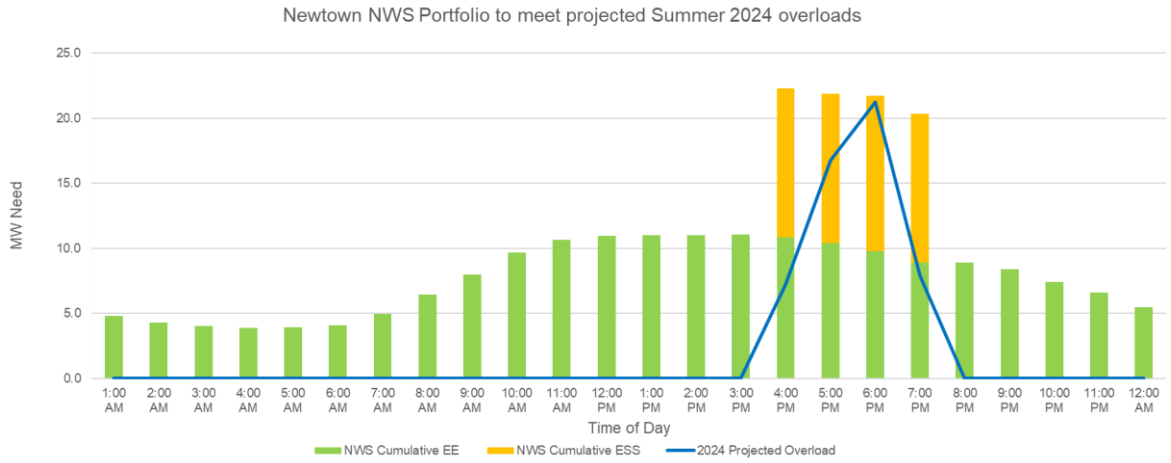
The Company issued a NWS RFP in July 2018, followed by an energy-storage specific RFP in June 2019, to defer or eliminate the projected overloads. Based on responses to these RFPs, the Company determined that a portfolio of customer-sided solutions could be developed to address both the substation and the sub-transmission feeder constraints. The Company then developed a cost-effective portfolio of solutions with a BCA of 1.34 and net benefits at a value of $24.1 million to provide 21.7 MW of load relief to meet the substation and sub-transmission feeder needs from summer of 2021 through 2024. This NWS portfolio defers the need for the load transfer project until 2025.

The NWS portfolio consists of energy efficiency and energy storage technologies. Energy efficiency solutions are being implemented via additional incentives applied to existing Company energy efficiency programs in the targeted area as well as an enhanced residential energy efficiency program. Dispatch rights to customer-sided energy storage systems have been procured through the June 2019 RFP to provide load reduction in the networks supplied by the Newtown and Glendale area substations.[3]

[3] After RFP responses were submitted to Con Edison in 2018 and through the first half of 2019, the incentives needed for the portfolio's energy storage projects remained unclear while dual participation in the NYISO was debated, and then later while the NYSERDA retail energy storage Market Acceleration Bridge Incentive was finalized. Once the eligibility of the Market Acceleration Bridge Incentive from NYSERDA was determined, the Company issued an additional RFP in June 2019 for energy storage. With the proposed energy storage projects selected, the Company achieved reasonable cost certainty to implement the NWS.

The chart below illustrates the projected 2024 overload and planned load relief for the Newtown NWS portfolio.

Figure 2: Planned Load Relief for the Newtown NWS Portfolio



As shown in Figure 2, by summer 2024, the Newtown substation and sub-transmission feeder's capabilities are expected to exceed their capability with projected overloads between 4 and 8 PM. The combination of energy efficiency measures and energy storage resources dispatched through the Newtown NWS are expected to alleviate these overloads, allowing the substation and sub-transmission feeder to operate within their current capability through summer 2024. Throughout the four-year deferral period, the Company will monitor system constraints identified in its 10-year load relief plan and, if needed, address any projected overloads.

BCA Summary

The portfolio of solutions assembled for the Newtown deferral project results in a Societal Cost Test (SCT) score of 1.34 and net benefits valued at $24.1 million. A high-level summary of the BCA is found in Table 2 below.

Table 2: Newtown NWS portfolio BCA summary

Peak Load Relief (MW)	Load Relief Period	Total Benefits (NPV)	Total Costs (NPV)	BCA SCT Score	Con Edison Investment (NPV)[4]	Customer Portion of Net Benefits	Performance Incentive[5]
21.7	2021-2024	$95.56M	$71.45M	1.34	$43.05M	$16.88.M (70% of Net Benefits)	$7.12M (30% of Net Benefits)

Table 3 below is a screenshot from Con Edison's BCA tool, which calculates the net present value of the costs and benefits of the project. Pursuing the Newtown NWS project over the traditional solution yields the following benefits:

- Avoiding 79,839 MWh of generated energy, saving customers $25.57 million;
- Avoiding 21.7 MW of generation capacity at the network peak with a corresponding customer savings of $23.38 million;
- Avoiding costs associated with primary and secondary distribution capacity infrastructure of $23.87 million for customers;
- The avoidance of CO_2 emissions, supporting New York State and New York City CO_2 emission reduction goals and providing a $11.76 million benefit; and
- Eliminating the need to build the traditional solution, saving customers $10.98 million.

The Company identified the following costs associated with implementing the NWS project:

[4] Includes planned expenditures for NWS incentives and non-incentive related costs. The incentive and non-incentive costs shown in the Company's BCA model in Table 4 are adjusted to account for regulatory asset treatment of NWS program expenditures and differ as a result.

[5] Per the Incentive Order, customers receive 70 percent of a NWS portfolio's net benefits, and the utility's shareholders earn 30 percent. The Company recovers incentive through the Monthly Adjustment Clause after it has been earned, i.e., once the requisite customer sided MW reductions are operational as defined in the Incentive Order.

- $37.45 million in program participant incentive costs to accelerate market adoption of energy efficiency, distributed generation and energy storage technologies in the specified NWS networks;
- $3.44 million in costs associated with the Company's administration and implementation of the NWS program, for items such as planning, training, marketing, and payments to independent contractors for evaluation, measurement, and verification; and
- $30.55 million in funds necessary to implement measures under the NWS program not provided by the Company.

Table 3: Newtown NWS Portfolio Societal Benefits and Costs

	Newtown NWS Portfolio											
		All Programs										
	Savings	Total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Summer MW Reduced (Network Peak)	21.708	1.1	14.54	3.90	1.6	0.6	-	-	-	-	-	-
	Annual MWh Reduced	79,839	7,700	26,346	28,726	13,217	3,850	-	-	-	-	-	-
	Benefit / Cost Ratios	Total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Electric	Annual AGCC Impact	23.38M	1M	17.1M	4.3M	2.0M	0.8M	0M	0M	0M	0M	0M	0M
	Annual LBMP Impact	25.57M	3M	9.0M	10.4M	4.8M	1.6M	0M	0M	0M	0M	0M	0M
	Electric T&D Impact: Transmission	0M	0M	0.0M	0.0M	0.0M	0.0M	0M	0M	0M	0M	0M	0M
	Electric T&D Impact: Primary	6.36M	0M	4.6M	1.3M	0.5M	0.2M	0M	0M	0M	0M	0M	0M
	Electric T&D Impact: Secondary	17.51M	1M	12.7M	3.5M	1.4M	0.5M	0M	0M	0M	0M	0M	0M
	Electric GHG Impact	11.76M	1M	4.2M	4.7M	2.1M	0.7M	0M	0M	0M	0M	0M	0M
	T&D Asset Deferral	10.98M											
Costs	Incentive Cost - Rev Req't	37.45M	1.6M	19.8M	8.6M	4.2M	2.1M	1.2M	1.2M	1.2M	1.2M	1.2M	1.2M
	Incentive Cost from Programs Funded by Customers	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M
	Other Participant Incentives from External Entities	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M	0M
	Participant Out-of-Pocket Cost	30.55M	1M	14M	8M	4M	2M	1M	1M	1M	1M	1M	1M
	Con Edison Costs (Implementation) - Rev Req't	3.44M	0.2M	2.0M	0.9M	0.4M	0M	0M	0M	0M	0M	0M	0M
	Total SCT Benefits	95.56M	7M	48M	24M	11M	4M	0M	0M	0M	0M	0M	0M
	Total SCT Costs	71.45M	3M	35M	17M	9M	4M	2M	2M	2M	2M	2M	3M
	SCT BCA Ratio	**1.34**	**2.08**	**1.34**	**1.40**	**1.23**	**0.90**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Net Benefits	24.11M	3M	12M	7M	2M	0M	-2M	-2M	-2M	-2M	-2M	-3M
	30% Net Benefits Pre-Tax	7.23M											

Appendix A: Traditional Whitepaper[6]

X	Capital
	O&M

2020– Electric Operations

Project/Program Title	Load Transfer Newtown to North Queens
Project Manager	Ramze Muntasser
Hyperion Project Number	PR.23492034
Status of Project	Planning
Estimated Start Date	Fall 2019
Estimated Completion Date	Spring 2022
Work Plan Category	Operationally Required

Work Description:

To de-load the Newtown sub-transmission feeders, the Company plans a transfer of approximately 40MW from Newtown Substation to North Queens Substation. 40MW's of load from the northern portion of the Borden (2Q) network was selected due to its geographical location. The design involves extending 10 network feeders from Long Island City to the Borden network. Ten feeders in the Borden network will be split to accommodate the transfer. The southern border of Long Island City network will be extended all the way to the new cutline following 44th Road in the south. The west and east boundaries are the natural cutline provided by The East River and Jackson Ave (boundary with Sunnyside Network). In order to accommodate this load, 12,612 feet of primary & secondary conduit, 110 sections of primary cable, 48 structures, 7 network transformers, 20 primary switches and 117 sections of secondary cable will be installed.

[6] The Newtown load transfer project was included in the Company's 2019 Rate Case filing. *Case 19-E-0065, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service.* (filed January 31, 2019). See "Rate Case Exhibits Vol. 3", Schedule 4, T&D Capital White Papers System Expansion.

Justification Summary:

A load transfer of 40 MW's from the Newtown Substation to the North Queens Substation is required prior to the summer of 2022 to avoid overloading both the Newtown Substation and the sub-transmission feeders supplying it. The transferred load will be added to the Long Island City network supplied by North Queens substation.

The load projections in the "2018-2027 Area Substation and Sub-transmission Feeder Ten-Year Load Relief Program" indicates that both the Newtown area substation and the 138 kV sub-transmission feeders supplying the Vernon/Glendale/Newtown load pocket will exceed their capabilities by the summer of 2022. The overloads occurred as result of the load growth in the Borden network, the Newtown Substation load will be 248 MW's by summer 2022, which exceeds the 244 MW capability of the substation by 4 MW (102%). This overload continues to grow as load increases in the ensuing years. Exceeding the capacity of the substation and transmission feeders could result in load shedding if contingencies occur during peak loading conditions. This would result in customer outages and increases the risk of equipment failure presenting and adversely impacting the community served.

This load transfer project will deload both the Newtown substation and the 138 kV supply feeders allowing them to operate within their thermal capability limits and provide enough capacity for future load growth.

Supplemental Information:

- Alternatives: Installation of fourth transformer and 138 kV supply feeder 38Q05 from Vernon (east bus) to increase area substation capability from 244MW to 361MW by 2022.

- Risk of No Action: An overload on the sub-transmission feeders supplying Newtown Substation is predicted to occur starting in 2022. In the event the sub-transmission feeders overload, load shedding would be required during peak load conditions.

- Non-financial Benefits: The benefits of the project are the relief of both the substation and transmission feeders, which will ensure continued reliable service to the Newtown load pocket.

- Summary of Financial Benefits (if applicable) and Costs: As discussed above, multiple alternatives were considered in-order to relieve the Newtown load pocket and the selected option is the least expensive.

- Technical Evaluation/Analysis: In general, infrastructure adequacy is determined by comparing the infrastructure capability, in this case the transmission system supplying the Newtown load pocket, against the net load to be served. The net load is determined from the gross forecasted customer demand less any load relief measures such as existing and forecasted energy efficiency or local distributed resources in the network.

  Poly Voltage Load flow (PVL) was utilized to determine any distribution cable and equipment overloads around the cutover area. The PVL case was scaled up to match the forecasted load growth for the summer of 2022.

  The Company will review all System Expansion projects to determine the Non-Wires Candidates as part of the Distribution planning process. The Company will then provide information regarding these candidates and their progress on its website as well as via periodic NWS filings.

- Project Relationships (if applicable):

- Basis for Estimate: Historical unit costs.

Annual Funding Levels ($000):

Historical Elements of Expense:

EOE	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
Labor	-	-	-	-		-
M&S	-	-	-	-		-
A/P	-	-	-	-		-
Other	-	-	-	-		-
Overheads	-	-	-	-		-
Total	-	-	-	-		-

Future Elements of Expense

EOE	Budget 2019	Request 2020	Request 2021	Request 2022	Request 2023
Labor	189	312	314	-	-
M&S	962	4,923	300	-	-
A/P	1,800	9,659	396	-	-
Other	344	1,435	238	-	-
Overheads	2,004	7,671	552	-	-
Total	**5,300**	**24,000**	**1,800**	**-**	**-**