Transmission and Distribution Capital Investment Plan

CASE 20-E-0380

JANUARY 31, 2024

PREPARED FOR:

THE STATE OF NEW YORK PUBLIC SERVICE COMMISSION

THREE EMPIRE STATE PLAZA

ALBANY, NY 12223

nationalgrid

2024 NY Capital Investment Plan

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List of Abbreviations and Acronyms

3V0	Zero-Sequence Voltage (used to detect overvoltage conditions)
AC	Asset Condition
ACR	Asset Condition Refurbishment
ADMS	Advanced Distribution Management System
ALS	Aerial Laser Survey
AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
BAAH	Breaker and a Half
BESS	Battery Energy Storage System
BPS	Bulk Power System
CB	Circuit Breaker
CCRP	Climate Change Resiliency Plan
CCVS	Climate Change Vulnerability Study
CCVT	Capacitor Couple Voltage Transformer
CH	Control House
CHG&E	Central Hudson Gas and Electric
CHI	Customer Hours Interrupted
CI	Customers Interrupted
CIAC	Contribution in Aid of Construction
CIP	Capital Investment Plan
CLCPA	Climate Leadership and Community Protection Act of 2019
CMI	Customer Minutes Interrupted
Commission	New York State Public Service Commission
ConEd	Consolidated Edison
CRV	Conservation Voltage Reduction
CS	Circuit Switcher
CS2.0	Cost Sharing 2.0
CVR	Conservation Voltage Reduction
DER	Distributed Energy Resources
DG	Distributed Generation
DGA	Dissolved Gas Analysis

DMX	Data Multiplexer
DOE	Department of Energy
DPS	Department of Public Service
DS0	Digital Signal 0
DSCADA	Distribution Supervisory Control and Data Acquisition
DSO	Distribution System Operator
DSP	Distributed System Platform
DWDM	Dense Wavelength Division Multiplexing
EHI	Energy Highway Initiative
EMS	Energy Management System
ERR	Engineering Reliability Review
EV	Electric Vehicles
FAA	Federal Aviation Administration
FANs	Field Area Networks
FERC	Federal Energy Regulatory Commission
FEMA	Federal Emergency Management Agency
FLISR	Fault Location, Isolation, and Service Restoration
FOC	Fiber Optic Cable
FP	Funding Project
FTM	Front of the Meter
GCB	Gas Circuit Breaker
GHG	Greenhouse Gas
GRIP	Grid Resilience and Innovation Partnership
HPFF	High Pressure Fluid Filled
I&M	Inspection & Maintenance
IIJA	Infrastructure Investment and Jobs Act
ILEC	Incumbent Local Exchange Carriers
IR	Infrared
IRU	Indefeasible Right to Use
IT	Information Technology
JU	Joint Utilities
LED	Light-Emitting Diode
LiDAR	Light Detecting and Ranging

LMR	Land Mobile Radio
LTC	Load Tap Changer
LVAC	Low Voltage Alternating Current
M&V	Measurement and Verification
MGP	Manufactured Gas Plant
MHDV	Medium and Heavy Duty Vehicles
MIT	Massachusetts Institute of Technology
MITS	Modular Integrated Transportable Substation
MOU	Memorandum of Understanding
MPLS	Multi-Protocol Label Switching
MRP	Make Ready Program
MSH	Minor Storm Hardening
MVD	Multi-Value Distribution
MVT	Multi-Value Transmission
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NIMO	Niagara Mohawk Power Corporation
NWA	Non-Wires Alternative
NY	New York
NYISO	New York Independent System Operator
NYPA	New York Power Authority
NYSERDA	New York State Energy Research and Development Authority
O&M	Operation and Maintenance
OCB	Oil Circuit Breaker
OEM	Original Equipment Manufacturer
OH	Overhead
OPGW	Optical Ground Wire
OpTel	Operational Telecommunication Modernization
PAL	Private Area Lighting
PAR	Phase Angle Regulator
PON	Program Opportunity Notice
POTS	Plain Old Telephone Service
PPI	Per-Plug Incentive

PPTPP	Public Policy Transmission Planning Process
PSC	New York Public Service Commission
PSS	Photonic Service Switch
PTP	Priority Transmission Projects
RC-MOD	Remote Control-Motor Operated Device
REV	Reforming the Energy Vision (Case 14-M-0101)
ROW	Right Of Way
RTU	Remote Terminal Unit
SA	Surge Arrester
Safety Order	Commission's Safety Order in Case 04-M-0159
SCADA	Supervisory Control and Data Acquisition
SF6	Sulfur Hexafluoride
SONET	Synchronous Optical Network
SPC	Smart Path Connect
SST	Station Service Transformer
SSVT	Station Service Voltage Transformer
Staff	New York Department of Public Service Staff
SUNY- ESF	State University of New York College of Environmental Science and Forestry
SVC	Static Var Compensator
T&D	Transmission and Distribution
TCC	Transmission Control Center
TGP 28	Company's Transmission Planning Guide
TLM	Transformer Line Maintenance
TLS	Transmission Line Services
TRF	Transformer
TVP	Time Varying Pricing
UG	Underground
VCB	Vacuum Circuit Breaker
VT	Voltage Transformer
VVO	Volt-Var Optimization
WL	Watertown/Lowville
WPF	Worst Performing Feeders
ZEV	Zero Emission Vehicles

Chapter 1: Executive Summary

Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") hereby submits its Five-Year Capital Investment Plan (the "Plan") in compliance with the New York Public Service Commission ("PSC" or the "Commission") Order, issued January 20, 2022, in Case 20-E-0380.[1] The Plan outlines projected capital investment levels during fiscal years 2025 to 2029 (FY25 to FY29).[2] The Plan investment levels are summarized in Table 1-1, below, and reflect the Company's present estimate of investment levels needed to meet its obligation to provide safe and adequate service at reasonable cost to customers, as well as to continue to modernize the electric system to address the evolving needs of customers.

Table 1-1
Capital Investment Plan by System ($ millions)

System/Investment Area	FY25	FY26	FY27	FY28	FY29	Total
Transmission	379.9	619.6	849.7	792.9	824.3	3466.4
Sub-Transmission	45.3	119.1	131.2	172.9	189.5	657.9
Distribution	680.8	918.1	898.0	1107.3	1087.6	4691.8
Local Spending Sub-Total[3]	**1106.1**	**1656.7**	**1878.9**	**2073.1**	**2101.3**	**8816.1**
Cost Share 2.0	0.0	22.5	22.5	22.5	22.5	90.0
EV MRP	4.5	5.7	8.8	10.9	12.0	41.9
Transmission - EV Fleet	0.0	5.3	10.7	10.7	28.5	55.3
Local Supplemental Spending Sub-Total[4]	**4.5**	**33.5**	**42.0**	**44.1**	**63.0**	**187.2**
CLCPA Ph2A	214.8	303.3	556.8	467.2	273.1	1815.3
FERC	0.2	0.0	0.0	0.0	0.0	0.2
Priority Transmission Project	153.3	66.3	12.6	0.0	0.0	232.3
Interregional Intertie	0.0	0.0	5.0	5.0	40.0	50.0
Regional Spending Sub-Total	**368.3**	**369.6**	**574.5**	**472.2**	**313.1**	**2097.7**
Grand Total	**1478.9**	**2059.8**	**2495.3**	**2589.5**	**2477.4**	**11100.9**

[1] *Case 20-E-0380 et al., Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service, Order Adopting Terms of Joint Proposal, Establishing Rate Plans and Reporting Requirements, issued and effective January 20, 2022 ("Rate Case Order").*
[2] *The period FY25 to FY29 covers April 1, 2024 - March 31, 2029.*
[3] *Local funding includes Ticonderoga, climate vulnerability investments, CLCPA Phase 1, AMI, and EV Highway. More detail on these projects/programs is provided in subsequent chapters.*
[4] *Local Supplemental and Regional funding categories consist of projects/programs that utilize a different recovery mechanism from the investments to be filed in the upcoming NIMO rate filing.*

The five-year investment plan presented here reflects the investments necessary to maintain reliability, continue to increase system resiliency, and enable a more animated, dynamic energy marketplace that will ultimately deliver greater value and benefits for customers. Table 1-1 details investments within three funding categories, Local, Local Supplemental, and Regional. The Local category depicts investments to be proposed in the upcoming NIMO rate filing, while Local Supplemental and Regional investments are funded though alternative recovery mechanisms and rates. These investments also enable the energy infrastructure needed to meet the goals envisioned under the New York's Climate Leadership and Community Protection Act ("CLCPA") and the Accelerated Renewable Energy Growth and Community Benefit Act. The Company continually reviews the Plan relative to current risks and information and will revise the Plan as required to meet emergent needs while continuing to provide safe and adequate service at a reasonable cost.

1. A. Capital Investment Plan Summary

The Plan is presented by system and spending rationale. A view of planned investments by system and funding category is presented in Table 1-1 above, while a view of planned investments by spending rationale is summarized below.

Investment by Spending Rationale

The Company classifies capital projects in this Plan according to 11 spending rationales based on the project's primary investment driver: Customer Requests/Public Requirements; Damage/Failure; System Capacity; Asset Condition; Multi-Value Distribution ("MVD"); Multi-Value Transmission ("MVT"); Reliability; Resiliency; Communications/Control Systems; Distributed Energy Resource ("DER") Electric Systems Access; and Non-Infrastructure. In addition, the Company has developed eight investment areas distinct from the foregoing traditional spending rationales within the Local Supplemental and Regional funding categories: Electric Vehicle ("EV") Fleet; Cost Share; Distribution EV Make Ready Program ("MRP"); CLCPA Phase 2A; Federal Energy Regulatory Commission ("FERC") Public Policy; Priority Transmission Projects; and Interregional Intertie.

Customer Requests/Public Requirements

Customer Requests/Public Requirements projects include capital expenditures required to address items including new business requests (residential and commercial), new metering installations, outdoor lighting, third-party attachments, land rights, municipal relocations, generator interconnections, and other requirements such as municipal and customer interconnections.

Damage/Failure

Damage Failure projects are required to replace failed or damaged equipment and to restore the electric system to its original configuration and capability following equipment damage or failure. Damage may be caused by storms, vehicle accidents, vandalism, or other unplanned events. The Damage/Failure spending rationale is typically non-discretionary in terms of scope and timing. The Damage/Failure budget may also include the cost of purchasing strategic spare equipment to respond to equipment failures.

System Capacity
System Capacity projects are required to upgrade the capability of the Transmission and Distribution ("T&D") delivery system to provide adequate stability, thermal loading, and voltage performance under existing and anticipated system conditions.

Asset Condition
Asset Condition projects are required to reduce the likelihood and consequences of failures of T&D assets. Examples of such projects include system element replacements such as overhead ("OH") lines, underground ("UG") cable, or substation equipment. Asset Condition investments reflect targeted replacement of assets based on condition, rather than wholesale replacement based on "end of useful life" criteria.

Multi-Value Distribution ("MVD")
MVD is a new spending rationale. These projects are driven by Asset Condition needs while also proactively addressing system capacity/hosting capacity constraints in support of state and federal clean energy goals.

Multi-Value Transmission ("MVT")
MVT projects satisfy traditional asset condition, reliability, safety, and compliance planning needs. They also address bottlenecks or constraints that limit the delivery of renewable energy or load serving capacity within the transmission system, in support of state and federal clean energy goals. CLCPA Phase 1 projects are included within this spending rationale; supporting development of projects in areas of renewable developer interest. These are areas of the State that have been identified by the utilities, Department of Public Service Staff ("Staff"), New York State Energy Research and Development Authority ("NYSERDA"), and others as ones in critical need of Phase 1 local transmission investment.

Reliability
Reliability projects are required to improve power quality, storm hardening,[5] and system performance.

Resiliency
Resiliency projects are intended to ensure the electric power system can recover quickly following a disaster or, more generally, the ability of anticipating extraordinary and high-impact, low-probability events and rapidly recovering from these disruptive events. With climate change concerns and the frequency of extreme weather events continuing to rise, climate-related projects included in the resiliency spending rationale are intended to invest in infrastructure vulnerable to weather projections. These types of weather hazards and projects were evaluated through the Climate Change Vulnerability Study ("CCVS") and Climate Change Resilience Plan ("CCRP"). The prioritized climate hazards assessed were wind gusts, radial icing, high temperature, and flooding at levels capable of impacting the distribution, sub-transmission, and transmission systems.

Communications/Control Systems
Communications/Control Systems projects are required for monitoring and controlling the transmission and distribution systems and include Energy Management System ("EMS") and Remote Terminal Unit ("RTU") installations and Operational Telecommunication ("OpTel") investments. This also includes the complete roll-out of Advanced Metering Infrastructure ("AMI").

[5] *Storm Hardening is defined as the ability of the system to withstand the damaging effects of storm activity. Storm Hardening falls under reliability because it is pre-contingency focused, whereas resiliency is more focused on post-contingency.*

DER Electric System Access ("DER")
DER Electric System Access projects are investments required to enable the Company to support implementation of non-wires alternatives ("NWA"), microgrids, battery energy storage systems ("BESS"), Distributed Generation ("DG") interconnections, and other third-party and market-driven needs.

Non-Infrastructure
Non-Infrastructure projects do not fit into one of the foregoing categories but are necessary for the safe and reliable operation of the electric system. Example projects include: substation physical security measures, radio system upgrades, and purchases of test equipment.

The investment areas described below are comprised of projects that, given their unique nature and because most are funded through an alternative mechanism, they are categorized and presented separately from the spending rationales.

Transmission – EV Fleet
Proposed investments in this category relate to new transmission infrastructure to support large fleets (delivery vehicles, school buses, freight shipping, etc.) and the large electric demand their charging needs create. Because fleets will require a large number of chargers, have very different usage patterns, and are "clustered" in specific areas, the impacts can vary substantially on different parts of the system.

Cost Share
The Cost Sharing mechanisms of the Standardized Interconnection Requirements gives utilities the opportunity to offer Utility-Initiated Upgrades. For projects selected for the Cost Share mechanism, utilities fund the baseline scope and developers fund the added hosting capacity scope.

Distribution – Electric Vehicle ("EV") Make Ready Program ("MRP")
The EV MRP is intended to supplement Front of the Meter ("FTM") costs of grid-side infrastructure upgrades required to serve qualified electric vehicle service applicants.

CLCPA Phase 2A
CLCPA Phase 2A Projects are to specifically fund projects in "Areas of Concern". These are certain areas of the State that have been identified by the Utilities, Staff, NYSERDA, and others to be in critical need of transmission investment. These areas are characterized by the presence of existing renewable generation experiencing curtailments and a strong level of developer interest that exceeds the capability of the local transmission system. These projects have been approved for funding by the NY PSC under Case 20-E-0197.

FERC Public Policy
FERC Public Policy projects are intended to meet the requirements of FERC Order 1000/Public Policy affecting National Grid facilities and assets, regardless of its affiliation to the Project Developer. These projects support New York State transmission needs and are recovered through the applicable FERC-Jurisdictional tariff. This includes funding for the Energy Highway Initiative ("EHI").

Priority Transmission Projects ("PTP")
Priority Transmission Projects are intended to meet the requirements of the first New York Power Authority ("NYPA") Priority Transmission Project(s) affecting National Grid facilities. Among these projects, National Grid was selected as a development partner by NYPA for Smart Path Connect

("SPC"). These projects support New York State transmission needs and are recovered through the applicable FERC-Jurisdictional tariff.

Interregional Intertie

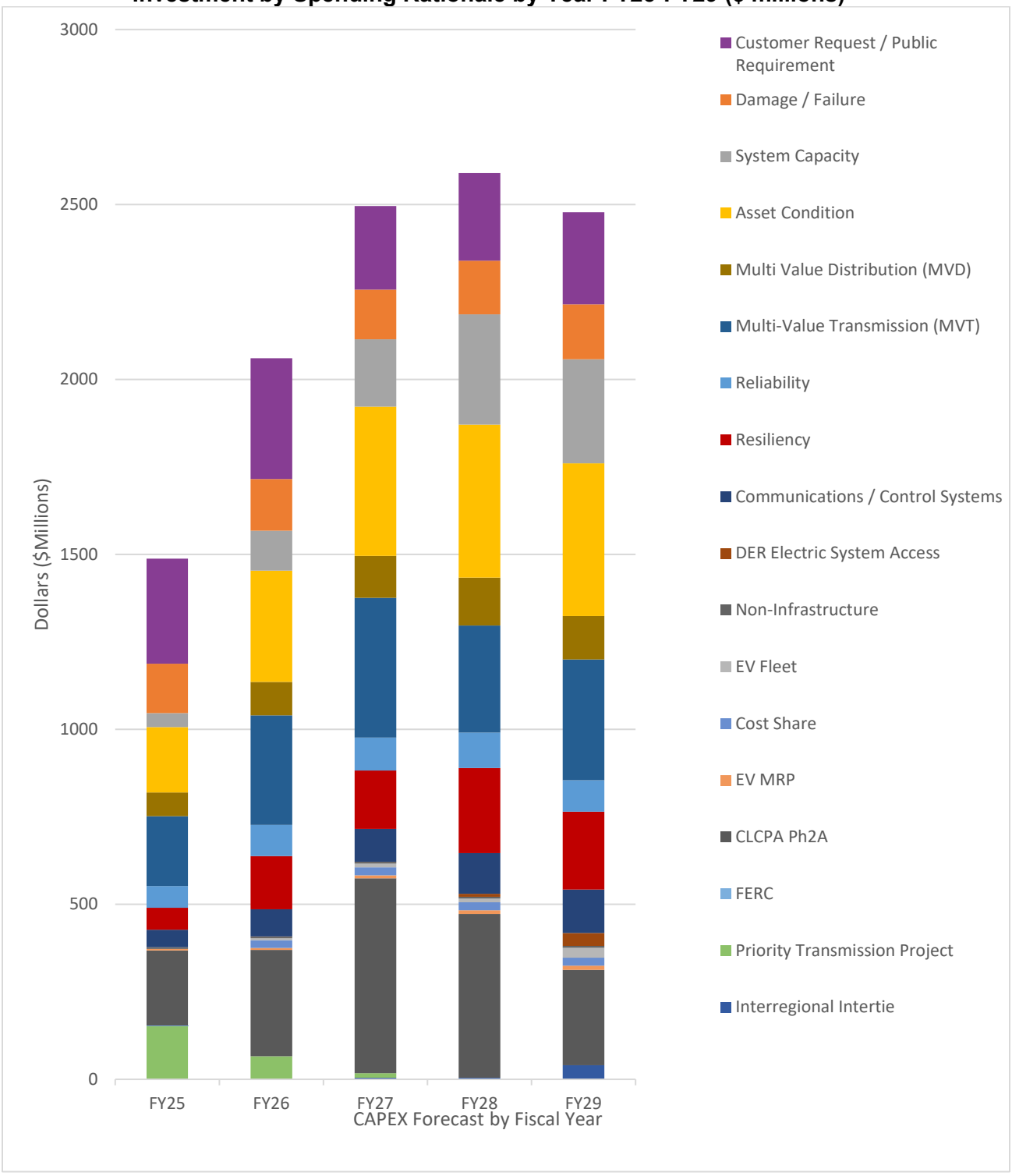
National Grid has developed a multi-value project to improve interregional transfer capacity between upstate New York and New England states. This is a unique opportunity to move forward with a project that provides cost benefits to New York customers with funding assistance from DOE. The project will upgrade certain transmission facilities in New York, and, when combined with a newly rebuilt line segment in New England, will allow the entire interregional line to improve its ability to economically transfer power from one area to the other for the benefit of customers.

Investment by spending rationale for fiscal years FY25 - FY29 is provided in Table 1-2 below and in Figure 1-1.

Table 1-2
Investment by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Requests / Public Requirement	300.1	345.0	238.5	250.1	262.8	1396.4
Damage / Failure	141.3	147.9	142.0	153.3	156.9	741.4
System Capacity	39.5	114.0	192.9	315.1	297.7	959.1
Asset Condition	178.6	316.3	425.5	437.4	436.1	1793.9
Multi-Value Distribution (MVD)	67.7	95.5	119.4	135.4	123.1	541.2
Multi-Value Transmission (MVT)	199.7	313.4	399.8	306.0	344.8	1563.6
Reliability	61.9	89.2	94.1	101.4	89.6	436.2
Resiliency	62.6	152.3	167.5	244.7	224.0	851.1
Communications / Control Systems	50.0	78.2	93.8	115.7	124.2	461.8
DER Electric System Access	0.0	0.1	0.5	9.0	37.1	46.7
Non-Infrastructure	4.7	4.8	4.9	5.1	5.2	24.7
Local Spending Sub-Total	**1106.1**	**1656.7**	**1878.9**	**2073.1**	**2101.3**	**8816.1**
Transmission - EV Fleet	0.0	5.3	10.7	10.7	28.5	55.3
Cost Share	0.0	22.5	22.5	22.5	22.5	90.0
EV MRP	4.5	5.7	8.8	10.9	12.0	41.9
Local Supplemental Spending Sub-Total	**4.5**	**33.5**	**42.0**	**44.1**	**63.0**	**187.2**
CLCPA Ph2A	214.8	303.3	556.8	467.2	273.1	1,815.3
FERC	0.2	0.0	0.0	0.0	0.0	0.2
Priority Transmission Project	153.3	66.3	12.6	0.0	0.0	232.3
Interregional Intertie	0.0	0.0	5.0	5.0	40.0	50.0
Regional Spending Sub-Total	**368.3**	**369.6**	**574.5**	**472.2**	**313.1**	**2,097.7**
Grand Total	**1,478.9**	**2,059.8**	**2,495.3**	**2,589.5**	**2,477.4**	**11,100.9**

Figure 1-1
Investment by Spending Rationale by Year FY25-FY29 ($ millions)



1. B. Investment by System

The following is a summary of planned investment by system. Chapters 2, 3, and 4 detail the transmission, sub-transmission, and distribution system spending, respectively.

Transmission System Summary

The transmission system consists of approximately 5,720 miles of transmission line, 192 transmission substations, about 500 large power transformers, and over 850 circuit breakers at operating voltages of 69kV and above.[6] To serve the needs of customers over the five-year period covered by this Plan, the Company expects to invest $5,614.6 million on the transmission system, as shown in Table 1-3 below. The majority of planned transmission system investment is in the Multi-Value Transmission, System Capacity, Communications / Control Systems, and Asset Condition spending rationales and CLCPA investment area. Multi-Value projects satisfy traditional asset condition, reliability, safety, and compliance planning needs, and can also address bottlenecks or constraints that limit the delivery of renewable energy or load serving capacity within the transmission system. The System Capacity category includes spending to address generator retirements, the North American Electric Reliability Corporation ("NERC")/NPCC standards and transmission owner-led system studies. The CLCPA and Priority Transmission Projects investment areas support the State's clean energy goals. Substantial portions of the planned investment in the Asset Condition category relate to substation rebuild and overhead line refurbishment programs. The Communications / Control Systems category includes spending on the OpTel program, EMS/RTU for Distribution Supervisory Control and Data Acquisition ("DSCADA"), Digital Data Service circuits (56Kb/s and 64Kb/s) (DS0), and Replacement of Digital Multiplexer ("DMX"), Microwave (Harris 5200), and older fiber optic cable projects for end-of-life assets.

[6] *In prior capital investment plan reports, assets operating at 69kV had been classified as sub-transmission.*

Table 1-3
Transmission System Capital Expenditure by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Requests/Public Requirements	12.8	3.3	0.0	0.0	0.0	16.1
Damage/Failure	21.9	16.8	18.4	17.1	13.7	87.9
System Capacity – NY	8.8	33.7	75.6	119.3	119.1	356.4
Asset Condition	72.8	141.8	227.2	224.9	228.7	895.5
Multi-Value Transmission (MVT)	199.7	313.4	399.8	306.0	344.8	1563.6
Reliability	14.3	37.5	45.9	40.2	45.4	183.4
Resiliency	35.8	41.9	39.7	27.0	10.4	154.8
Communications/ Control Systems	13.6	30.9	42.8	58.1	61.8	207.2
Non-Infrastructure	0.3	0.3	0.3	0.3	0.3	1.5
Local Sub-Total	**379.9**	**619.6**	**849.7**	**792.9**	**824.3**	**3466.4**
Transmission- EV Fleet	0.0	5.3	10.7	10.7	28.5	55.3
Local Supplemental Sub-Total	**0.0**	**5.3**	**10.7**	**10.7**	**28.5**	**55.3**
CLCPA Ph2A	213.9	300.8	556.8	466.0	273.0	1,810.6
FERC	0.2	0.0	0.0	0.0	0.0	0.2
Priority Transmission Project	153.3	66.3	12.6	0.0	0.0	232.3
Interregional Intertie	0.0	0.0	5.0	5.0	40.0	50.0
Regional Sub-Total	**367.3**	**367.1**	**574.5**	**471.0**	**313.0**	**2,093.0**
Grand Total	**747.3**	**992.0**	**1,434.9**	**1,274.6**	**1,165.8**	**5,614.6**

Sub-Transmission ("Sub-T") System Summary

The sub-transmission system is comprised of lines and substations operating at 46kV, 34.5kV, 23kV, and a small subset of 12kV (less than 4 miles). National Grid has approximately 2,900 circuit miles of overhead sub-transmission lines and 656 circuit miles of sub-transmission underground cable. To serve the needs of customers over the five-year period covered by this Plan, the Company expects to invest $657.9 million on the sub-transmission system, as shown in Table 1-4 below.

Table 1-4
Sub – Transmission System Capital Expenditure by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Requests/Public Requirements	2.8	2.3	1.6	2.5	3.5	12.7
Damage/Failure	4.3	4.3	4.8	4.6	4.3	22.4
System Capacity – NY	0.8	15.6	17.3	38.2	37.5	109.4
Asset Condition	27.3	56.5	58.9	54.5	55.1	252.1
Multi Value Distribution (MVD)	3.0	10.8	18.0	19.6	26.3	77.7
Reliability	1.6	3.9	2.2	13.0	8.8	29.6
Resiliency	5.6	25.5	28.0	31.5	17.9	108.5
DER Electric System Access	0.0	0.1	0.5	9.0	36.0	45.6
Local Spending Total	**45.3**	**119.1**	**131.2**	**172.9**	**189.5**	**657.9**
Grand Total	**45.3**	**119.1**	**131.2**	**172.9**	**189.5**	**657.9**

Distribution System Summary

The Company's distribution system consists of lines and substations operating at 15kV and below. There are over 36,600 circuit miles of overhead primary wire and over 7,900 circuit miles of underground primary cable on the system supplying approximately 421,000 overhead, padmount and underground distribution transformers. Additionally, there are 526 substations providing service to the Company's over 1.67 million electric customers. To serve the needs of customers over the five-year period covered by this Plan, the Company expects to invest $4,824.4 million on the distribution system, as shown in Table 1-5 below. The majority of planned distribution system investment is in the Multi-Value Distribution, Customer Request / Public Requirement, Asset Condition, and Resiliency spending rationales. Multi-Value projects are driven by Asset Condition needs while also proactively addressing system capacity /hosting capacity constraints in support of state and federal clean energy goals The Customer Request / Public Requirement category includes projects required to address such items as new business requests (residential and commercial), new metering installations, outdoor lighting, third-party attachments, land rights, municipal relocations, generator interconnections. Substantial portions of the planned investment in the Asset Condition category relate to substation rebuild and overhead line refurbishment programs. The Resiliency category includes spending on the Fault Location, Isolation, and Service Restoration ("FLISR"), and CCRP projects.

Table 1-5
Distribution System Capital Expenditure by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Request/Public Requirement	284.4	339.4	236.9	247.6	259.3	1,367.6
Damage/Failure	115.2	126.7	118.8	131.6	138.9	631.1
System Capacity – NY	29.9	64.7	99.9	157.6	141.1	493.2
Asset Condition	78.6	118.0	139.4	158.1	152.3	646.3
Multi-Value Distribution (MVD)	64.7	84.7	101.4	115.8	96.8	463.5
Reliability	46.0	47.7	46.0	48.1	35.4	223.2
Resiliency	21.2	84.9	99.9	186.2	195.6	587.8
Communications/ Control Systems	36.4	47.3	51.0	57.6	62.3	254.6
DER Electric System Access	0.0	0.0	0.0	0.0	1.1	1.1
Non-Infrastructure	4.4	4.5	4.6	4.8	4.9	23.2
Local Spending Total	**680.8**	**918.1**	**898.0**	**1,107.3**	**1,087.6**	**4,691.8**
EV MRP	4.5	5.7	8.8	10.9	12.0	41.9
Cost Share 2.0	0.0	22.5	22.5	22.5	22.5	90.0
Local Supplemental Spending Total	**4.5**	**28.2**	**31.3**	**33.4**	**34.5**	**131.9**
CLCPA Ph2A	1.0	2.5	0.0	1.2	0.0	4.7
Regional Spending Total	**1.0**	**2.5**	**0.0**	**1.2**	**0.0**	**4.7**
Grand Total	**686.3**	**948.7**	**929.3**	**1,142.0**	**1,122.1**	**4,828.4**

1. C. Significant Investment Areas Addressed by 2024 Plan

The Plan is designed to effectively address system investment needs, which include emergent as well as long-term issues. Significant or new areas of investment and focus in this year's Plan include:

- Asset Condition
- Multi-Value Distribution ("MVD")
- Multi-Value Transmission ("MVT")
- Resiliency
- Advanced Communications, Monitoring, Controls, and DER Integration
- Battery Energy Storage Systems ("BESS")
- Electric Vehicles ("EV")
- Non-Wires Alternatives ("NWA")
- Cost Sharing 2.0

Asset Condition
Asset Condition issues represent approximately 16% of the total capital investment in the Plan. Asset Condition investments proactively address deteriorated assets before failure, reducing the likelihood and consequences of electric system failures. This proactive approach is vital to the Company's ability to achieve our short and long term decarbonization goals, maintain suitable service reliability, operational flexibility, and is essential to maintaining customer satisfaction and system performance. To support data driven decision making, the Company continually analyzes eight primary substation and overhead line asset class lifespans, including wooden poles, steel towers, underground devices, substation and line transformers, metal clads, circuit breakers, and volt/var equipment (substation capacitors and voltage regulators). This analysis helps to forecast asset replacement coincident peaks across our asset classes, so that the Company may mitigate these coincident failures and peak resource demand through proactive replacements.

Multi-Value Distribution ("MVD")
A new MVD spending rationale was created in FY24 to provide visibility on projects with the primary driver of asset condition that also increase system capacity and/or hosting capacity. MVD Projects can also provide benefits to reliability and resiliency. A large number of previously classified Asset Condition projects have been reclassified to the MVD spending rationale to highlight National Grid's effort to proactively increase system capacity or hosting capacity simultaneous to the in-kind replacement of deteriorated assets. This can involve replacing existing assets with new, larger capacity assets; converting lower distribution voltages (ex: 4kV) to higher voltage classes (ex: 15kV); and/or expanding sites to allow for the retirement of nearby deteriorated assets. This approach can allow for maximized and efficient interconnection of green energy and zero emission vehicles ("ZEV"), and heating solutions.

Multi-Value Transmission ("MVT")
The Plan includes MVT projects that are intended to address both National Grid system needs and State transmission needs that address clean energy targets. These projects maximize the utilization of existing and planned renewable resources while avoiding the cost of over-built or otherwise inefficient solutions which only address a single system need. The MVT projects satisfy traditional asset condition, reliability, safety, and compliance planning needs, and can also address bottlenecks or constraints that limit the delivery of renewable energy or load serving capacity within the transmission system.

Multi-Value Transmission upgrades include:

- Circuit rebuilds with larger current carrying conductors.
- Circuit rebuilds at higher operating voltages (e.g., from 69 kV to 115 kV) to transmit higher levels of energy on the same conductors.
- Replacement of existing transformers with higher capability transformers.
- Reconfigurations and/or additions of new circuits or substation transformers to increase overall transfer capability.
- Addition or capability upgrades of Phase Angle Regulators ("PARs") or series reactors, each of which help control and balance flows on the power system to make more effective use of the system and increase overall system transfer capability.
- Replacement and upgrade of existing "weak-link" equipment (notably in substations) which currently serve as "choke points" that restrict overall transfer capability.

Resiliency Investments

The Plan includes several projects specifically intended to address resiliency efforts. The Resiliency spending rationale was created to provide clear visibility on projects that give the utility the ability to recover quickly following a large-scale interruption or, more generally, the ability to anticipate extraordinary and high-impact, low-probability events and then rapidly recover from said events. This involves not only increasing the flexibility of the grid with feeder ties, but also smartening the grid by installing FLISR schemes and distribution line sensors. Currently, only about 5% of the distribution feeders and circuits on the system have automated feeder ties. Through the installation of FLISR on 15kV feeders in NY with a target of approximately two-thirds (66%) of 15kV class feeders, the Company expects the impact of outages to be reduced by isolating unaffected portions of feeders and restoring customers via automated feeder ties.

In addition to adding automated FLISR schemes on the distribution system, the Company plans to target deployments of FLISR schemes to approximately half (50%) of its NY sub-transmission circuits, which will further reduce the impact of outages by restoring entire feeders at a given time by re-routing power from the source. These sub-transmission schemes will further reduce outage impacts across the State by automatically restoring customers whose source is connected to the sub-transmission system and will enhance the resiliency of the areas where these schemes are deployed. Once FLISR is deployed to all eligible 15kV feeders and sub-transmission circuits, the Company expects to have approximately 60% of NY customers connected to feeders or fed from circuits with FLISR schemes. In addition to specific resiliency projects, resiliency-related costs are reflected in other projects and programs in the form of enhanced standards or equipment costs. At the transmission level this includes an updated system design to reduce the number of customers interrupted by a transmission-level event and minimizing the time to restore service through additional breakers, switching capability, and the installation of additional supplies to load pockets.

In addition to projects and programs to prepare for high-impact, low-probability events across the distribution and transmission system, the Company performed a Climate Change Vulnerability Study and developed a Resilience Plan to understand projected climate hazard impacts and how to adapt and build a resilient system to maintain reliability. As a result of the Climate Change Resilience Plan, investments to adapt to climate change now include transmission, sub-transmission, and distribution line standard upgrades, distribution-targeted undergrounding for wind and icing projections, substation transformer ambient temperature specification upgrades to withstand higher temperatures, and substation flood walls to withstand low probability, high impact

flooding events. A resilient system will reduce reliability impacts caused by increasingly volatile weather and storm events but will take several years to fully implement.

Advanced Communications, Monitoring, Controls, and DER Integration
The Company is continuing to evolve in the role of the Distributed System Platform / Distribution System Operator ("DSP/DSO") provider by expanding the ability of third-party providers of DER to deliver value to both customers and the electric system, and by modernizing the electric grid. Investments in advanced communications, monitoring, and controls technologies are essential to enhance DER integration. Examples of such investments included in this Plan include:

- Telecommunications enhancements
- System monitoring (RTUs)
- Proactive system upgrades (i.e., $3V_0$ system protection and bi-directional LTC controller)
- Energy Storage monitoring and control
- DSCADA
- Clean innovation projects
- AMI

AMI is a foundational component of the Company's grid modernization efforts. The Company's AMI implementation plan was approved by the Commission on November 20, 2020 with modifications that included adjusting the BCA to reflect "opt-in" time-varying pricing ("TVP") assumptions, enhanced data latency, and a cap on capital investments at $475.2M in the first six years after implementation commences. The subsequent NMPC Rate Order approved further details regarding project implementation and cost treatment. A detailed design and back-office systems installation began in FY22. The Field Area Network ("FAN") deployment started in February 2023, with a soft launch in April 2023 and full deployment in August 2023. More details on the Company's AMI investment are presented in Chapter 4 of the Plan.

Battery Energy Storage Systems ("BESS")
In December 2022, NYSERDA and the Department of Public Service ("DPS") Staff proposed *New York's 6 GW Energy Storage Roadmap* for PSC consideration. The intent of the proposal is to assess needed market reforms and cost-effective procurement mechanisms to achieve New York's increased energy storage target. Some use cases and revenue streams are not currently available to energy storage resources through any market, including T&D services. BESS assets are seen as an alternative to needs that have been historically met with traditional solutions, while also being able to provide operational support that traditional solutions cannot provide, such as voltage support, VAR support, and other ancillary services. The Company has currently included approximately 40 MW of Company-owned storage projects to meet grid planning requirements by 2030. More information on specific projects can be found in Chapters 3 and 4 of the Plan.

Following increases in storage interconnections and to mitigate safety concerns associated with BESS projects, a New York Interagency Fire Safety Working Group was established to ensure safety and security of BESS projects and in response to thermal events at New York BESS project sites in the summer 2023. Outcomes from this Group's work seeks to include recommendations that influence how current and future projects should be assessed and will impact projects within this Plan. Any recommendations coming out of the Working Group will be included in current and future energy storage projects, whenever possible, to ensure safe, reliable design and operation of all BESS projects.

Electric Vehicles ("EV")
The Plan includes a robust set of EV programs intended to promote and accommodate EV adoption across all customer segments while maximizing utilization of existing grid infrastructure. The program aligns with the State's policies and goals as set forth in several Commission proceedings focused on EVs, including: 1) Case 18-E-0138, which enables a light-duty EV make-ready program, residential managed charging program, a Medium- and Heavy-Duty Vehicle ("MHDV") Pilot Program, fleet assessment services, and Transit Authority Make-Ready support; 2) Case 18-E-0206, which addresses modifications to the Company's voluntary time-of-use rate to better support residential customers who own EVs; 3) Case 22-E-0236, which modifies the Per-Plug Incentive ("PPI") program to create commercial rate designs for EV charging sites, demand charge rebates, commercial managed charging programs, and load management technology incentives; and 4) Case 23-E-0070, which addresses barriers to MHD EV charging infrastructure. The Plan also includes infrastructure investment to accommodate EV load growth identified through the Company's typical system capacity planning procedures, which may not be directly associated with the PSC programs and cases noted above. Additionally, the Company anticipates the need for distribution and transmission infrastructure in support of electric fleets and highway charging, particularly in certain concentrated pockets across Upstate NY as highlighted in the Transmission section above. The Company is actively identifying and evaluating these areas through various planning and load forecasting studies.

Non-Wires Alternatives ("NWA")
The NWA processes/guidelines are continuously under review and are periodically updated in conjunction with the Reforming the Energy Vision ("REV") proceeding, New York State Joint Utility ("JU") discussions, and/or internal efforts. Implementing the NWA process internally and socializing the process externally will create consistency with the JU and move towards a cohesive process that helps animate markets, create realistic expectations for DER stakeholders, increase DER sourcing, and ultimately saves money for National Grid's customers. Review and evaluation of projects for both interim bridge-to-wires solutions and for the deferral of capital projects is consistently completed each year to assess whether a DER solution can fulfill the planning requirements to support our customers with safe and reliable service. Exhibit 4 lists the projects currently being evaluated for potential NWA solutions.

Cost Sharing 2.0 ("CS2.0")
CS2.0 mechanisms of the Standardized Interconnection Requirements gives utilities the opportunity to offer Utility-Initiated Upgrades. These include Proactive 3V0 projects and CS2.0 Multi-Value Distribution projects. CS2.0 Multi-Value Distribution projects are substation projects in the Plan with a baseline scope for a traditional need and the opportunity to increase scope for added hosting capacity. For projects selected for the CS2.0 Multi-Value Distribution mechanism, utilities fund the baseline scope and developers fund the added hosting capacity scope. Candidates for CS2.0 Multi-Value Distribution are noted in Exhibit 7. The Company plans to gauge market interest before proceeding with CS2.0 Multi-Value Distribution projects.

1. D. Development of the Capital Investment Plan

The Plan is based on the Company's current assessment of the needs of the electric delivery system over the Plan period. Known mandatory programs and projects (*i.e.*, those under Customer Requests/Public Requirements and Damage/Failure spending rationales) are included in the Plan. Such programs and projects include new customer connections, regulatory commitments, public requirements that necessitate relocation or removal of facilities, safety and

environmental compliance, and system integrity projects, such as response to damage/failure and storms.

Programs and projects in the other categories (*e.g.*, System Capacity and Asset Condition spending categories) are developed based on system studies and evaluation of existing assets by subject matter experts for inclusion in the Plan. While each project is given a single spending rationale, many projects serve needs related to several spending rationales as the Company strives to identify and capture overlapping investment drivers/system needs and develop cost effective multi-valued solutions. Inclusion/exclusion of any given project is based on several factors including, but not limited to changes in the need date for the project, changing priorities within the electric portfolios, new or changing customer requirements, resource availability, value score, project in-progress status, and regulatory input through rate cases. In addition, when it can be accomplished, the bundling of work and/or projects is analyzed to optimize the total cost and outage planning. In general, unless the ultimate system or customer need for the project has been eliminated, projects not included in the current year's budget will normally be prioritized within the outer years of the capital plans and included in a future year's budget. Exhibit 6 shows a list of capital projects greater than $500,000 that were actively considered but not included in the current year's budget during the annual budget build cycle.

The time-period over which the Company must budget its infrastructure investments can result in changes to budgets and project estimates. Such changes may be due to project scope, material or resource costs, customer needs, or a more refined estimate based on where the project is in its development. External factors, such as generation retirement announcements or new regulatory or legislative requirements or initiatives, may also drive changes in the Plan budget.

Costs for projects that are already in process, or are soon to be in process, generally have +/- 10% cost estimates. Other projects at earlier stages in the project evolution process, and the budgets for those projects, are accordingly less refined and are more susceptible to changes in scope and estimate. The projects in the Company's portfolio are continuously reviewed for changes in assumptions, constraints, project delays (particularly related to novel supply chain challenges), accelerations, weather impacts, outage coordination, permitting/licensing/agency approvals, system operations, performance, safety, and customer-driven needs that arise. The portfolio is updated throughout the year.

The Plan includes certain reserve line items to accommodate contingencies not known at the time the Plan is developed and to allocate funds for projects in future years whose scope and timing have not yet been determined. As specific project details become available, emergent projects are added to the Plan with funding drawn from the reserve funds or from re-prioritization of individual projects in the Plan. The Company tracks and manages budgetary reserves and emergent work as part of its investment planning and current-year spending management processes and reports that information quarterly to Staff.

The Company uses different approaches to deliver the Plan based on the differences in scope and character of transmission and distribution construction. With respect to the transmission portion of the Company's investment plan, the Company will supplement its internal workforce with competitively procured contractor resources. On the distribution side, the Company's internal workforce will continue to be primarily supplemented by the Company's contractor-of-choice arrangements and competitively procured contractor resources.

The Company continually reviews the Plan relative to current risks and information and will revise the Plan as required to meet emergent needs while continuing to provide safe and adequate

service at a fair cost. The Company has implemented and continues to calibrate a digital tool, known internally as FutureNow, built by Copperleaf Technologies Inc., to enhance our ability to manage our investments across the entire electric portfolio. The tool provides functionality that establishes a common, data driven approach to managing and prioritizing system investments, as well as model impacts of changes to project forecasts and estimates.

The Company's risk-based approach to selecting projects and programs for inclusion in the Plan, data driven approach for managing and prioritizing expenditures, efforts to improve cost estimating, and service quality metrics that include substantial financial consequences for project/portfolio estimate variations, results in a Plan that aims to meet the needs of customers at a fair cost.

1. E. Organization of this Filing

The remainder of this filing provides details on the programs and projects that comprise the Plan. The document is divided into the following chapters:

- Chapter 2 - Transmission System
- Chapter 3 - Sub-Transmission System
- Chapter 4 - Distribution System
- Chapter 5 - Investment by Transmission Study Area
- Chapter 6 - Exhibits

Chapter 2: Transmission System

The Company expects to invest approximately $5,614.6 million on the transmission system over the next five years, as shown in Table 2-1 below.

Table 2-1
Transmission System Capital Expenditure by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Request/Public Requirement	12.8	3.3	0.0	0.0	0.0	16.1
Damage/Failure	21.9	16.8	18.4	17.1	13.7	87.9
System Capacity – NY	8.8	33.7	75.6	119.3	119.1	356.4
Asset Condition	72.8	141.8	227.2	224.9	228.7	895.5
Multi-Value Transmission (MVT)	199.7	313.4	399.8	306.0	344.8	1563.6
Reliability	14.3	37.5	45.9	40.2	45.4	183.4
Resiliency	35.8	41.9	39.7	27.0	10.4	154.8
Communications/ Control Systems	13.6	30.9	42.8	58.1	61.8	207.2
Non-Infrastructure	0.3	0.3	0.3	0.3	0.3	1.5
Local Sub-Total	**379.9**	**619.6**	**849.7**	**792.9**	**824.3**	**3466.4**
Transmission- EV Fleet	0.0	5.3	10.7	10.7	28.5	55.3
Local Supplemental Sub-Total	**0.0**	**5.3**	**10.7**	**10.7**	**28.5**	**55.3**
CLCPA Ph2A	213.9	300.8	556.8	466.0	273.0	1,810.6
FERC	0.2	0.0	0.0	0.0	0.0	0.2
Priority Transmission Project	153.3	66.3	12.6	0.0	0.0	232.3
Interregional Intertie	0.0	0.0	5.0	5.0	40.0	50.0
Regional Sub-Total	**367.3**	**367.1**	**574.5**	**471.0**	**313.0**	**2,093.0**
Grand Total	**747.3**	**992.0**	**1,434.9**	**1,274.6**	**1,165.8**	**5,614.6**

This chapter briefly describes major investment categories that comprise a significant portion of the Company's overall five-year transmission Plan. A complete list of transmission projects in the Plan is found in Exhibit 1.

The sections below describe the investment drivers and customer benefits of the projects along with a description of significant changes from last year's Plan. Specific asset condition and performance issues are described in further detail in the bi-annual Report on the Condition of Physical Elements of Transmission and Distribution Systems filing to the PSC, most recently filed on October 1, 2022, Case 20-E-0380.

2. A. Customer Requests/Public Requirements

Transmission investments in this spending rationale include acquisition of necessary land rights and public requirements (including municipal requests), customer interconnections, and wind farms. Because customer interconnection projects are typically reimbursable (i.e., costs incurred by the Company are paid by the customer), there is no net impact to the Plan from such projects.

Farmington Station 168 Interconnection (C087525 - $3.2M)

This project provides for the interconnection of 115kV Mortimer-Elbridge 2 line and Pannell (Station 122) - Border City 4 line to RG&E's Farmington Station 168 at the request of RG&E.

Drivers:
RG&E is rebuilding their Station 168 and requested an additional source from National Grid.

Customer Benefits:
RG&E needed an additional source into their system in Northern Ontario County.

2023 to 2024 Variance:
Project timing was adjusted to meet customer's schedule and supply chain issues.

Table 2-2
Transmission – Farmington Station 168 Interconnection
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.7	1.2	0.0	0.0	0.0	-	1.9
2024	-	3.2	0.0	0.0	0.0	0.0	3.2

Station 056 Interconnect (C085736 - $2.9M)

This project provides for the interconnection of RG&E Pittsford Station 056 to National Grid's 115kV Mortimer-Pannell 24 line.

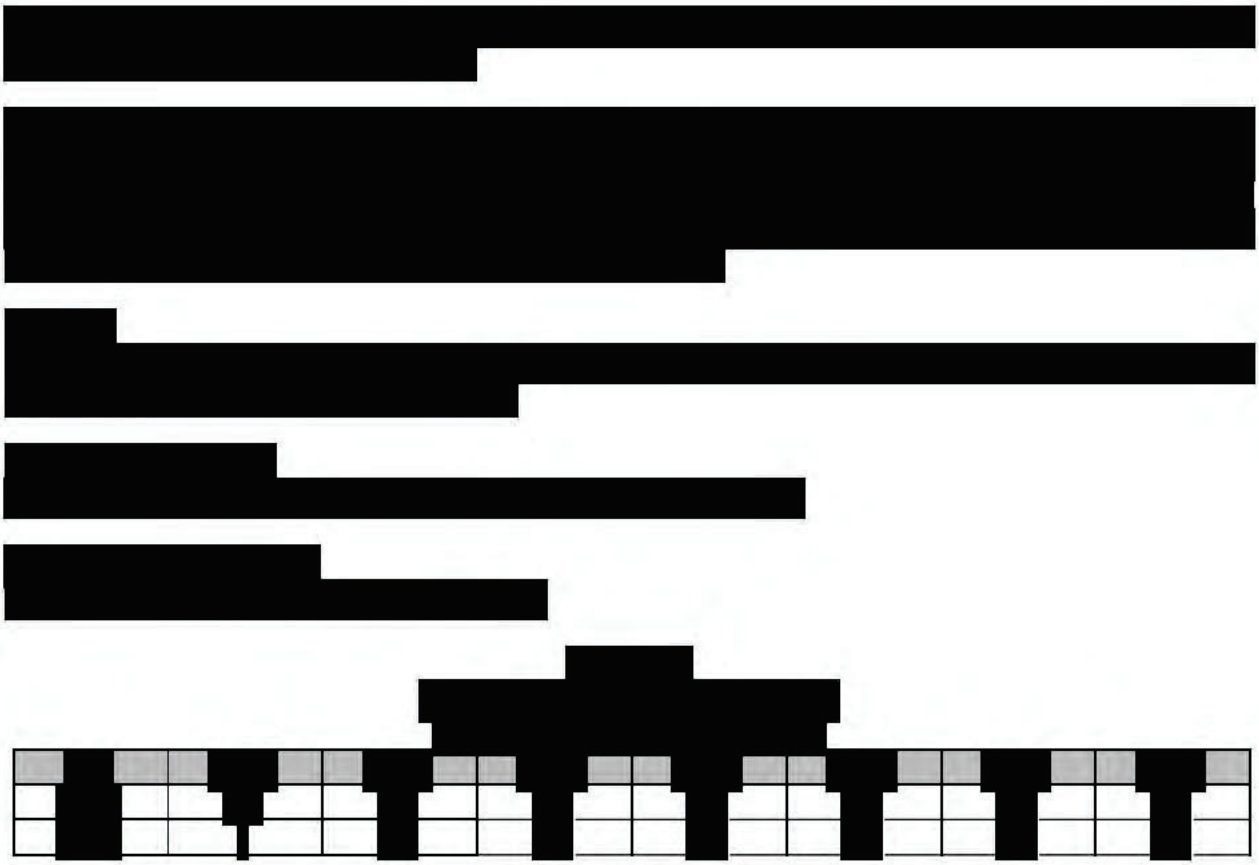
Drivers:
RG&E is rebuilding Pittsford Station 056 and has requested an additional source from National Grid.

Customer Benefits:
RG&E needed an additional source into their system.

2023 to 2024 Variance:
Project is progressing as to meet customer schedule changes.

Table 2-3
Transmission – Station 56 Interconnect
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	6.5	0.0	0.0	0.0	0.0	0.0	6.5
2024	-	2.9	0.0	0.0	0.0	0.0	2.9



Huntley-Gardenville 79/80 FAA Light (C091994 - $1.3M)

The obstruction lighting on the 230kV Huntley–Gardenville 79/80 line towers is not functioning properly and requires a refresh to address this issue. This project will install a new lighting system including replacement of the fixtures, installation of new 120V power sources, and will replace the lights with a newer model.

Drivers:
The primary driver is safety. The Federal Aviation Administration ("FAA") mandates the maintenance of obstruction lighting on these towers due to their heights and proximity to air traffic routes. The lights allow the towers to be visible to pilots in flight. Almost all of the lights on the line are not functioning as designed or are on their secondary bulb. The refresh will convert the lights from incandescent to light-emitting diode ("LED") and include a monitoring and alarm system. In addition, the new obstruction lights will consist of an infrared ("IR") bulb that will provide tower visibility at night to helicopter pilots with night vision goggles.

Customer Benefits:
Obstruction lighting is required on these towers per FAA regulations because it help pilots identify the towers in adverse conditions. This reduces the potential for aircraft incidents with the transmission structures and lines.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-5
Transmission – Huntley-Gardenville 79/80 FAA Light
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	-	1.3	0.0	0.0	0.0	0.0	1.3

2. B. Damage/Failure

The Damage/Failure investment levels for the transmission system are based on historical actual costs. The Company does not forecast any significant specific transmission system projects in the Damage/Failure spending rationale over the five-year period of the Plan.

Gardenville-Five Mile 151/152 Culvert Replacement (C086795 & C087268 - $19.9M)

This project will address the high-priority failed culverts along the 115kV Gardenville-Five Mile 151/152 corridor. The Gardenville – Five Mile Culvert Replacement project, C086795, was created to capture all the estimates and inspection cost of the damaged culverts. As each individual or group of culverts progress through engineering, a new specific funding project is generated. Then in the portfolio, C086795 is debited the corresponding amount. C087268 will address culverts 40 and 42 in the corridor.

During Fall 2018, Transmission Line Maintenance (“TLM”) was notified by a landowner of a slope failure in the 151/152 Gardenville-Five Mile Rd corridor just north of Abbott Hill Rd in the Town of Concord. Following a site visit and subsequent comprehensive inspections of the corridor from the air, numerous other areas were identified. At this time, no 115kV double circuit transmission structures are in imminent danger. However, slope stability and culvert deterioration need to be remediated so landowner property, access roads and electric assets are not damaged.

A civil and environmental consulting engineering firm was retained to inspect the corridor and triaged sites that required immediate attention from those that could be repaired/replaced later. It was determined by the consultant and confirmed by National Grid that 20 of the 108 culverts under the 151/152 Gardenville-Five Mile Rd corridor between Str 127 at the north end at Omphalius Road and Str 208 at the south end south of Sharp Road were in immediate need of replacement.

To date, National Grid has replaced or is replacing four culverts and has a plan to continue replacement of the highest priority culverts each year.

Drivers:
As culverts or wing walls fail, there is a potential for fine-grained soils to mix with stormwater. The Company's consultant has identified 20 culverts in need of near-term replacement.

Customer Benefits:
The community supports this project as many of them have been affected by flooding caused by inadequately sized or plugged culverts over the past few years. The community and wildlife will benefit from conserving a clean Eighteen Mile Creek.

2023 to 2024 Variance:
The project is progressing; however, culvert replacements originally scheduled for FY24 have been deferred one year to FY25 based on project priorities.

Table 2-6
Transmission – Gardenville-Five Mile Culvert Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	1.6	1.3	11.8	0.6	-	15.4
2024	-	0.0	3.1	7.4	6.4	3.0	19.9

Huntley to Kensington Fiber D/F (C087893 - $1.7M)

The fiber optic ring segment between Huntley Station and Elm St. Station is severely degraded and needs to be replaced. Failure of this fiber will cause loss of redundancy in the Buffalo area protection ring. In the case of additional fiber segment failure on this ring, line protection would be compromised, and line outages may be required.

Drivers:
The 20+ year old eight strand fiber optic cable has a high percentage of defective fibers creating very limited spare capability if any of the existing working fibers become defective. The reliability of the Tele-Protection, emergency management system ("EMS"), supervisory control and data acquisition ("SCADA"), and plain old telephone service ("POTS") lines are questionable on the optical carrier OC-12 and OC-192 communication rings. The current fiber condition and capacity is insufficient for the company to build the rings to transfer the future bandwidth of Multi-Protocol Label Switching ("MPLS").

Customer Benefits:
New 96 strand fiber restores spare fiber count and provides parallel fiber paths between the existing Synchronous Optical Network ("SONET") and the new MPLS fibers which are required to migrate the obsolete SONET DMX equipment to a replacement MPLS technology.

This cable will be brought to existing stations along the route making future connections possible to the network. Additional fibers along the route will also accommodate the distribution substations that are included on Verizon's list for disconnection of remote terminal units ("RTU") and POTS lines.

2023 to 2024 Variance:
The projects are proceeding as planned and the variance between FY23 and FY24 is based on changes as project scopes refine and integrate with our fiber network expansion.

Table 2-7
Transmission – Huntley to Kensington Fiber D/F
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	1.7	0.0	0.0	-	1.7
2024	-	1.7	0.0	0.0	0.0	0.0	1.7

Volney Station Memco Disconnect Switch Replacement (C087900 - $1.1M)

As part of the investigation following the failure of a 345kV Memco disconnect switch, inspections using drone, IR and visual reviews were performed at this and other similar substations across New York. These inspections identified and called out the recommendation to replace 13 345kV MEMCO switches at this station.

Drivers:
The 13 disconnect switches identified by inspection show signs of failure like the initial failure and/or had other concerns that warranted more urgent replacement.

Customer Benefits:
Replacement of the identified disconnect switches will reduce the likelihood of a similar failure and maintain system reliability.

2023 to 2024 Variance:
The project is progressing and as efficiencies and outages are available the work is being completed.

Table 2-8
Transmission – Volney Station Memco Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.5	0.5	0.4	0.0	0.0	-	1.4
2024	-	0.2	0.5	0.4	0.0	0.0	1.1

Trans Verizon Disconnect (C089903, C089938 & C089943 - $7.2M)

National Grid must maintain a reliable communication link between the control centers and substations for operational needs and between substations for protective relaying communication paths. Communication providers are retiring, and no longer supporting repairs to older copper analog circuits.

Drivers:
The protection of Company transmission overhead line and substation assets require a communication path. Communication providers are phasing out analog leased circuits used by National Grid. These projects address communication damage failures of the old circuits for which providers do not offer repair options, urgent/short notice disconnect notices, and any missed notice disconnects that slip through from communication providers. National Grid will quickly migrate these analog protection circuits to Verizon digital DS1 circuits and/or Company-owned private fiber/microwave networks to maintain protection and communication needs.

Customer Benefits:
National Grid must transition to a new technology for obsolete copper circuits that are used for our energy management system, relay protection, radio, information technology ("IT"), SCADA, and telemetry. These projects are driven by the need to continue to provide a reliable communication link between the control centers and substations with existing copper circuit retirements.

2023 to 2024 Variance:
The variance between FY23 and FY24 is due to increased materials and labor costs.

Table 2-9
Transmission –Verizon Disconnect
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.4	1.4	1.4	1.4	1.4	-	7.0
2024	-	1.5	1.4	1.4	1.4	1.4	7.2

Lafayette R915 Replacement Top 5 SF6 leaks (C088905 - $1.1M)

The 345kV sulfur hexafluoride ("SF6") GCB at Lafayette Station has deteriorated over its lifetime especially pertaining to the flanges and interconnection point of the bushings and the tank of the circuit breaker. This has allowed SF6 leaks in the past and has been a consistent issue.

Drivers:
Replacing the deteriorated gas circuit breaker will reduce the release of SF6 gas.

Customer Benefits:
If the deteriorated gas circuit breaker is not replaced, it could develop a significant SF6 leak and must be removed from service.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-10
Lafayette R915 Replacement Top 5 SF6 leaks
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.5	0.6	0.0	0.0	0.0	1.1

Mallory Station Transformer TRF 1 Damage Failure (C089594 - $1.4M)

The transformer TRF 1 had a radiator fail and upon inspection it was also identified that the bushings had sustained damage and failed testing.

Drivers:
The project is to replace transformer TRF1 due to the failure of the radiator and bushings.

Customer Benefits:
The benefit of replacing a failed asset is to maintain customer reliability.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-11
Mallory TB-1 Damage Failure
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.4	0.0	0.0	0.0	0.0	1.4

Solvay Station - Replace Transformer TRF 1 (C089947 - $1.4M)

Transformer Bank TB1 A, B and C at Solvay Station is configured as three single-phase units. One phase experienced an internal fault and failed. The remaining two phases were taken out of service.

Drivers:
The driver of this project is to replace transformer TB1 due to the failure of a single phase transformer in the bank.

Customer Benefits:
The benefit of replacing a failed asset is to maintain customer reliability.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-12
Solvay – TB-1 Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.4	0.0	0.0	0.0	0.0	1.4

Dunkirk-Falconer 160 Str. 122, 124 (C090515 - $1.8M)

During a preconstruction field inspection on structure 123, structures 122 and 124 were found to have extensive woodpecker damage. The field inspection also identified heavy woodpecker damage on structures 49, 109, 110, and 220. These four structures are also included in this project scope. In total, all six structures were at risk of potential failure.

Drivers:
The asset condition issues on the structures are the primary driver of this project. The deterioration of the structures negatively impacts the resiliency and safety of the line due to the increased potential risk of failure.

Customer Benefits:
Replacement of the identified structures will reduce the likelihood of failure, maintain system reliability, and improve line resiliency.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-13
Dunkirk-Falconer 160 Str. 122, 124
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.3	0.5	0.0	0.0	0.0	1.8

Upstate NY Transmission Verizon Disconnect FY24 (C092760 - $1.4M)

The copper-based circuits (DS0) that Verizon has supplied to the Company in the past will no longer be supported on Verizon's network. Also, manufacturers no longer build equipment for this obsolete technology.

Drivers:
Verizon is no longer supporting the copper circuits in their network, and they have been sending out reports that detail which Company sites will be impacted and their disconnect date.

Customer Benefits:
Transitioning from a copper circuit to fiber optic circuit will make the communication network more reliable, and scalable as technology and bandwidth demands increase.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-14
Upstate NY Transmission Verizon Disconnect FY24
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.4	0.0	0.0	0.0	0.0	1.4

2. C. System Capacity

The System Capacity spending rationale consists of: generator retirements, transmission owner-led system studies, transmission ISO-led system studies (in compliance with NERC/NPCC and NYSRC reliability rules), and transmission projects in support of distribution capacity issues.

2 E.1 Generator Retirements

Generator retirement-related projects are intended to reinforce the transmission system to avoid or mitigate reliance on market generators to maintain system reliability and performance.

The Company does not control, and has limited ability to project, future generator retirements. As a result, investment plans related to unannounced retirements are difficult to develop. The Company actively participates in NYISO working groups that monitor generator retirements.

Future generator retirement announcements that affect the Company's investment needs will be reflected in the Company's subsequent investment plans. Some reinforcement projects are related to CLCPA efforts and need to be planned in advance of generator retirements to support the system (e.g., Mortimer-Golah 110 described earlier in this section).

2 E.2 Transmission Owner-Led System Studies

These projects result from studies performed by the Company's Transmission Planning department. Transmission needs and alternative solutions are investigated during periodic area studies to determine whether the system complies with reliability standards. Included in this analysis is: compliance with NERC TPL reliability standards; NPCC Regional Reliability Reference Directory #1; NYSRC reliability rules; and the Company's Transmission Planning Guide ("TGP 28"). These standards require the entire transmission system to meet voltage, thermal, and stability criteria.

2 E.3 Transmission ISO-Led System Studies

These system projects result from studies performed by the NYISO and further analyzed by the Company's Transmission Planning department. Transmission needs and alternative solutions are investigated during periodic studies to determine whether the system complies with reliability standards. Included in this analysis is: compliance with NERC TPL reliability standards; NPCC Regional Reliability Reference Directory #1; and NYSRC reliability rules. The NYISO also considers the voltage and loading criteria in the Company's Transmission Planning Guide ("TGP 28"). These standards require the entire transmission system to meet voltage, thermal, and stability criteria.

2 E.4 EV – Local Projects

Highway EV chargers will likely be direct current fast charging (DCFC) with charging rates of 150 kW – 350 kW per port for light-duty vehicles and higher rates for medium- and heavy-duty vehicles. For highways, these characteristics will lead to points of significant demand that are expected to be met through transmission upgrades. Distribution upgrades are addressed in projects C094392, C094393, C094394, C094396, C094380, C094387, C094400, AND C094401.

Eastern NY Division Reinforcements

Reinforcements in the Company's Eastern Division are focused in the Capital and Hudson areas, as well as in the Mohawk area.

Ephratah Station Rebuild (C093959 - $1.5M)

This project will upgrade the Ephratah Station to a 69/13.2kV substation with one 25 MVA transformer while retiring the existing 69/23 kV transformer and associated equipment.

Drivers:
The driver of this project is the asset condition of the 23kV Ephratah-Caroga 2 line which needs a complete rebuild. After evaluating the cost of rebuilding the 23 kV line and the Caroga Station at the end of this radial line, it was determined that it is more cost effective to rebuild the Ephratah Station and serve Caroga Lake at 13.2 kV.

Customer Benefits:
The customers in Caroga Lake are expected to have significantly improved reliability when served at 13.2 kV along State Hwy 10 versus the inaccessible rear-lot 23 kV line which currently supplies Caroga Lake. In addition, once completed, an automatic distribution load transfer scheme can be implemented in Caroga Lake to further enhance reliability.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-15
Transmission – Ephratah Station Rebuild
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.0	0.1	1.4	1.5

Western NY Region Reinforcements

This program involves significant capital expenditure over the next five years and beyond to construct reinforcements of the 115kV transmission system in Western New York, including the Frontier and Genesee regions that extend from the Buffalo area east to Mortimer Station. This program will strengthen the transmission network and ensure adherence to reliability standards. It will correct existing asset condition, safety, operational and environmental concerns and improve the reliability of several circuits.

The major components in this program with investment levels greater than $1 million in any fiscal year[1]:

130/133 T-Line Reconductor (C079500 - $35.4M)

Reconductoring/rebuilding the thermally constrained portions of the 115kV Packard-Huntley 130 and Walck-Huntley 133 lines.

Packard-Gardenville T-Line Reconfiguration (C081799 - $5.3M)
Frontier 181 ACR/Reconductor (C060215 - $25.0M)

Reconfiguring the lines between Packard and Gardenville to alleviate area thermal overloads

Packard-Gardenville Station Upgrades (C079506 - $1.6M)

Installation of series reactors on the Packard-Gardenville 181/182 115kV circuit to increase circuit impedance, reduce circuit power flow and alleviate contingent thermal constraints, and install two new breakers.

Drivers:
Studies of the 115kV and 230kV transmission systems were conducted for the Frontier, Southwest and Genesee regions of Western New York to determine compliance with applicable reliability standards. The studies evaluated the system for existing load levels up to a fifteen-year

[1] *The costs shown below are limited to the period covered by this Plan.*

forecasted load level. Included within each of these evaluations was N-1 and N-1-1 testing design criteria and compliance with NERC TPL Standards, NPCC Directory #1, NYSRC reliability rules and the Company's TGP-28. These standards require the entire transmission system to meet N-0 and N-1 voltage, thermal and stability criteria and bulk power system and long lead time items to meet the same criteria for N-1-1 conditions. Several reliability criteria issues for the study area were identified under various study conditions. In the Frontier Region, multiple reinforcement projects are required to correct adverse conditions.

In 2017, the NYISO solicited and evaluated proposed solutions, in accordance with the Public Policy Transmission Planning Process ("PPTPP"), to address transmission needs in Western New York that are driven by Public Policy Requirements for greater utilization of renewable energy from the Niagara hydroelectric facility and through imports from Ontario, Canada. However, the completed NYISO-selected NextEra project did not address overloads on the National Grid local area 115kV transmission system. This results in the need for multiple area projects to relieve thermal constraints under contingency scenarios.

Customer Benefits:
Reduced exposure to service interruptions, including load shedding in the event of certain key contingencies. Reduced or eliminated need to dispatch generation out of merit to ensure acceptable facility loading, voltage support and stability, and capability to accommodate new and expanding load will be added to the system.

2023 to 2024 Variance:
The variance between the 2023 and 2024 Plans is due to a refinement of the projects required to address the remaining 115kV congestion issue in response to the NYISO Public Policy project selection.

Table 2-16
Transmission – Western NY Region Reinforcements
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.9	7.1	18.3	13.6	25.8	-	66.7
2024	-	1.4	5.7	17.0	21.6	21.5	67.3

Western Division – Genesee Region

Mortimer - Pannell 24/25 (C047816 - $101.5M)
Easements-Line Rebuild MP 24 (C093270 - $10.8M)
Access Roads-Mortimer-Pannell 24 25 (C093207 $6.9M)

These projects rebuild approximately 17 miles of the 115kV Mortimer-Pannell Lines 24/25 lines including new conductor and new structures.

Drivers:
The existing conductor is 336.4 MCM "Oriole" ACSR conductor dating from the 1930's. The steel core has rotted due to failure of its zinc coating resulting in elongated and breaking strands of conductor. In addition, NYISO studies have shown overloads on these lines for various contingencies.

Customer Benefits:
Maintain reliability to customers and additional capacity to support economic growth and the electrification of heating and transportation.

2023 to 2024 Variance:
Improved scope and supply chain issues have increased the project spend.

Table 2-17
Transmission – Mortimer - Pannell 24/25
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.6	0.5	4.0	8.9	26.9	-	40.9
2024	-	0.8	5.7	24.5	47.2	41.0	119.2

2 E.5 Transmission Projects in Support of Distribution

The following transmission projects were identified by the Distribution Planning department to support the distribution and/or sub-transmission system.

E. Golah 2nd 115kV tap (C051829 - $1.5M)

This is a new four mile 115kV line from Golah to East Golah to provide a second 115kV source to East Golah Station.

Drivers:
The load at risk at East Golah Station exceeds the Distribution Planning criteria threshold.

Customer Benefits:
This project improves reliability to customers supplied by the 115-13.2kV East Golah Station.

2023 to 2024 Variance:
This project has been rephased in the 2024 Plan.

Table 2-18
Transmission – E. Golah 2nd 115 kV tap
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.5	-	0.5
2024	-	0.0	0.0	0.0	0.5	1.0	1.5

Western Division – Frontier Region

Katherine Street Terminal Station Suite
Katherine St Term L145/146 T-Line (C089018 - $19.8M)
Katherine St Term 115/23kV Sub (C089019 - $51.1M)
Katherine St Term Land (C089057 - $2.7M)

These projects provide for 115kV line extensions to a new terminal substation as well as reconductoring a four-mile portion of existing lines 145 and 146 to support the new Katherine

Street 115-23kV terminal substation. The scope includes four 115/23kV, 50 MVA transformers and associated buses, switches, and breakers for twelve 23kV feeders.

Drivers:
Distribution Planning has determined that the 23kV system supplying the distribution substations in and near the City of Buffalo requires reinforcement. A number of alternatives have been reviewed and a new terminal substation near Katherine Street is the proposed source to relieve Seneca Terminal, Kensington Terminal and Sawyer Terminal Stations.

Customer Benefits:
Improved capacity to supply the area given the electrification of heat and transportation. This will also provide 23kV ties between the new terminal station and adjacent terminal stations to improve the resiliency of the system.

2023 to 2024 Variance:
The variance is due to substation design modifications required to accommodate a change to the 115kV substation taps.

Table 2-19
Transmission – Katherine St. Term STATION
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.2	0.3	4.0	7.0	21.0	-	32.6
2024	-	3.1	10.0	13.0	22.2	25.2	73.5

Western Division – Frontier Region

Elm Street Relief – Add 4th Transformer (C049594 - $1.0M)

This project adds a fourth 230/23kV transformer to Elm Street Station in the City of Buffalo's downtown and replaces all 23kV circuit breakers with an interrupting rating of less than 40kA.

Drivers:
The Elm Street Station supplies the City of Buffalo's low voltage alternating current ("LVAC") network, spot network loads, and several distribution substations. Elm Street Station has four transformers, with three operating in parallel, and is designed for double contingency operation due to its supply to the Buffalo downtown area. This project includes the replacement of 23kV breakers with higher rated interrupting capability due to increased fault current at the substation.

Customer Benefits:
This project restores the capability of the substation and provides for some limited load growth.

2023 to 2024 Variance:
This project is progressing given supply chain delays and is nearing completion.

Table 2-20
Transmission – Elm Street Relief – Add 4th Transformer
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.2	0.0	0.0	0.0	0.0	-	1.2
2024	-	1.0	0.0	0.0	0.0	0.0	1.0

Central Division – Northern Region

Malone Station Rebuild_Tline (C059673 - $2.9M)
Malone Substation Rebuild_T_Sub (C069306 – 19.0M)

The loss of the 115/13.8kV transformer TRF 3 at the Malone Station would result in outage exposure in excess of distribution planning criteria. To address this criteria violation, a 115/13.8kV transformer TRF 4 will be added at the Malone substation with four new feeder positions.

Drivers:
Presently, the contingency loss of the Malone 115/13.8kV Transformer TRF 3 would result in 14.8 MW load at risk (403.26MWh). This would exceed the criteria, as there are no 13.2kV feeder ties available in the area that could be utilized as back-up.

Customer Benefits:
This project eliminates all the MWhs at risk and eliminates all the asset condition issues.

2023 to 2024 Variance:
The variation on the project is due to schedule changes to meet the project needs.

Table 2-21
Transmission – Malone Station Rebuild Transmission Line
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	2.6	2.5	2.3	0.2	0.0	-	7.6
2024	-	1.0	7.5	10.1	3.2	0.0	21.9

Central Division – Syracuse Oswego Cortland Region

Dewitt 115kV Station Rebuild

Dewitt Station 115kV Rebuild (C081783 – $4.6M),
Dewitt Station 115kV Rebuild LAB (C081784 - $3.5M),
Dewitt Station Relocate 115kV Line (C082023 - $0.06M)

This project rebuilds the 115kV portion of DeWitt Substation to meet NPCC Directory 4 requirements for Bulk Power Transmission Substations. This includes additional relaying, and new control wiring and new conduit systems.

Drivers:
This project will occur if the NYISO conducts NPCC A-10 testing on DeWitt Station with a failing result for the present configuration of breakers, relaying and control wiring.

Customer Benefits:
Improved reliability of the Transmission System.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-22
Transmission – Dewitt Station 115kV Rebuild
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.1	0.3	7.7	8.1

Reconductor Cortland Clarks Corners (C053141 – $2.5M)

This project reconductors less than one mile of Cortland-Clarks Corners 1-716 in two separate sections.

Drivers:
Both National Grid and Avangrid identified portions of this line being overloaded during the Annual Planning Assessments (TPL-001) and other studies.

Customer Benefits:
This project maintains the reliability of the 115kV system and the ability to supply load during various contingencies on the National Grid and Avangrid transmission systems.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-23
Transmission – Reconductor Cortland Clarks Corners
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.01	0.4	2.1	0.0	0.0	2.5

Eastern Division - Northeast Region

Battenkill Station Rebuild (C093948 – $2.3M)

This project upgrades the 13.2kV transformer to a 40 MVA unit to support the retirement of the majority of the 34.5kV Schuylerville-Mechanicville 4 line and the Schuylerville Station while mitigating overload concerns predicted by our load forecast.

Drivers:
The 34.5kV Schuylerville-Mechanicville 4 line requires the replacement of a considerable number of structures over many miles. The replacement of the substation transformer in the Battenkill Station and its associated distribution work will allow for the retirement of the majority of the line

while transferring the load on the Schuylerville Station from the 34.5kV system to the more reliable 115kV system.

Customer Benefits:
This project should improve reliability for the customers served out of the Schuylerville Station while providing additional capacity to serve future load.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-24
Transmission – Battenkill Rebuild: Substation
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.1	0.9	0.5	0.8	2.3

NY Load Tap Changers ("LTC") Controller – Transmission Substation Program (C085943 - $2.0M)

The Company plans to update existing transformer LTC controllers to newer, modern controls at FERC-T (transmission) classified substations to integrate with the Company's current SCADA platform and new Advanced Distribution Management System ("ADMS"). These newly updated LTC controls will enable real-time control capability and status monitoring for Control Center Operators and support engineering studies with increased data from the LTC. The Company plans to begin using an application in ADMS to control voltage at the LTC, while monitoring customer voltage readings at their meters through a new AMI feedback loop. This will allow the LTC and its associated feeders to operate at the lowest possible voltage (within the limits of ANSI C84.1) to increase efficiency, reduce energy demand, and energy consumption through LTC-only Conservation Voltage Reduction ("CVR"). This will provide benefits generated through LTC control and CVR operation to distribution feeders that will not have any full Volt-Var Optimization (VVO) / CVR schemes within the period of this report. The transmission program for upgrading LTC controllers will starting FY25.

Drivers:
The Company has historically managed feeder voltage primarily through the use of remote, autonomously controlled LTCs. When installed, LTCs are typically programmed to maintain a specific voltage at the substation bus, as specified by Distribution Planning based on peak load periods.

The primary driver of this project is to provide more efficient and higher quality power by centrally monitoring the voltage performance across the distribution system in real-time and automating the control of the LTC throughout the year via an integrated ADMS-based control scheme using AMI data to feedback customer voltage. The NY LTC Controller – T Sub program adds a layer of coordination, via communication and control, to optimize the use of the LTC to respond to system dynamics in real-time.

Customer Benefits:

- Lower voltage profiles, reduced demand, and reduced energy consumption by customers. The estimated reduction in power and energy consumption is expected to be approximately 1.5% but will vary based on the individual feeder characteristics.
- Increased near real-time operational data availability to the regional control centers. This data will be collected from LTCs and will improve management of the distribution system and integration of future distributed energy resources.
- Actively maintained proper voltage via an automated and centralized control to improve feeder voltage performance and keep the voltage low, potentially increase hosting capacity and allow for greater levels of Distributed Energy Resource ("DER").
- Delivering voltages at the optimal levels will reduce energy consumption, improve service quality, and lower costs.

2023 to 2024 Variance:

The FERC T portion of the program for upgrading LTC controllers will start in FY26 to align with the continuation of the FERC D portion of the program. This short pause in the LTC Controller program also reflects the shift towards programs such as FLISR that focus in the areas of reliability and resiliency improvements.

Table 2-25
NY LTC Controller - Transmission Substation Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.6	0.6	0.3	0.2	-	1.7
2024	-	0.0	0.6	0.9	0.3	0.2	2.0

EV Highway[2]: The below projects are a part of a suite of projects to support EV charging at NYS Thruway travel plazas.

Genesee Region

- **EV Highway - Pembroke (Flying J)-T-line (C094378 - $5.4M)**

Southwest Region

- **EV Highway - Angola -T-line (C094381 - $10.2M)**

Syracuse Oswego Cortland Region

- **EV Highway - Dewitt-T-line (C094383 - $10.7M)**
- **EV Highway - Chittenango-T-line (C094386 - $20.3M)**

Capital Hudson Valley Region

- **EV Highway - Pattersonville-T-line (C094389 - $5.5M)**

[2] *For the associated Mobile Storage EV Highway projects, refer to section 4.A. of this document. For the associated Distribution EV Highway projects, refer to section 4.C. of this document.*

These projects are needed to support large electric vehicle ("EV") charging demand at highway service plazas. There are specific New York State laws that mandate zero emissions vehicles ("ZEV") adoption: requirement for 35% light duty vehicle ZEV sales by model year 2026 under Advanced Clean Cars-II, 100% of school bus purchases must be ZEV by 2027, 30-50% medium and heavy-duty ZEV sales by 2030 under the Advanced Clean Trucks rule, 100% ZEV sales for LDV by 2035 and MHDV by 2045.

Vehicle manufacturers are increasingly releasing new and better-performing models of EVs (and announcing plans to phase out internal combustion models), and EV sales are increasing markedly.

Highway charging is required to meet EV drivers' needs on key highway corridors. Range anxiety is viewed as a remaining hurdle to widespread adoption of electric vehicles, and long charging times would similarly dissuade drivers from converting. To address these concerns and enable EVs to meet existing drivers' needs (including those of fleet and truck operators, whose charging needs will be greater than passenger vehicle drivers), highway charging will require upgrades to electric infrastructure.

Drivers:
Highway EV chargers will be direct current fast charging (DCFC) with charging rates of 150 kW – 350 kW per port for light-duty vehicles, and even up to 1-3 MW for medium- and heavy-duty vehicles. Based on load forecasting analysis at specific sites[3], we anticipate that expansion of the Distribution and Transmission network will be required to serve the rest stop charging loads due to load sizes reaching multiple megawatts. Some of the rest stops are located in rural areas with limited load growth from non-EV sources, which in some cases result in these rest stops being fed from distribution circuits with lower capacities and limited existing plans for capacity expansion.

Customer Benefits:
These investments provide sufficient system capacity and resilience to support the broad adoption of commercial and passenger electric vehicles required to meet climate goals and State policy. Once complete these projects will also reduce or even eliminate customer frustration with lengthy delays to add system capacity for incremental electric vehicle charging load.

2023 to 2024 Variance:
The variance is primarily driven by the funding in FY28 (last year's Capital Investment Plan ("CIP") only went through FY27), as well as improved estimates based on advanced EV highway load forecasting studies that have progressed over the past year. Through analysis of traffic flows, machine learning model, telematics data from Daimler Trucks, geospatial analysis, and Electric Power Research Institute's EVs2Scale database, the Company now has improved visibility of where highway fast charging loads will materialize, which informs where distribution and transmission upgrades will be required. The Company has also released public studies[4] on how vehicle fleet clusters transitioning to electric and highway fast-charging loads and their impact

[3] *Electric Highways: Accelerating and Optimizing Fast-Charging Deployment for Carbon-Free Transportation; National Grid, RMI, CALSTART, Geotab, Stable Auto; 2022. Available at: https://www.nationalgrid.com/us/EVhighway*

[4] *See: "The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets", September, 2021; "The Road to Transportation Decarbonization: Readying the Grid for Electric Fleets," Sep., 2023. Available at: https://www.nationalgridus.com/News/National-Grid-and-Hitachi-Energy-Transportation-Decarbonization-Study-Highlights-Path-to-Readying-the-Grid-for-Electric-Fleets/*
"Electric Highways: Accelerating and Optimizing Fast-Charging Deployment for Carbon-Free Transportation," November, 2022. Available at: https://www.nationalgrid.com/us/EVhighway

distribution and transmission circuits. Those studies support this forecast, which has been determined to be a more reasonable ramp rate.

Table 2-26
Transmission – Transmission EV Highway – Local Projects
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	8.0	11.0	15.0	-	34.0
2024	-	0.4	2.5	6.4	23.3	19.3	51.9

2. D. Asset Condition

Asset Condition investments, such as replacing elements of overhead circuits, underground cable, or substation equipment, are required to reduce the likelihood and consequence of the failure of transmission assets. This Plan also relies on the purchase of spare equipment to replace damaged equipment that may fail while in service for certain elements of the transmission and distribution system. This approach calls for more targeted replacement of assets based on their condition versus wholesale replacement of age-based "end of useful life" criteria.

For overhead circuits specifically, this Plan seeks to achieve compliance with National Electrical Safety Code ("NESC") requirements and will continue to implement the recommendation from Staff's 2010 rate case testimony to refurbish overhead transmission circuit facilities that are in an unacceptably severe deteriorated condition (i.e. National Grid's defined Level 1, Level 2 and Level 3 conditions), as opposed to refurbishing entire circuits, unless a compelling justification can be provided for the full refurbishment. Any overhead circuit proposed for refurbishment will undergo a field inspection by qualified transmission line engineers and will usually be supported by comprehensive aerial inspection. As part of the conceptual engineering process, refurbishment options will be thoroughly evaluated on a case-by-case basis, and the engineering economics of various options such as a complete reconductoring versus a life extension are reviewed in the project sanctioning process. In addition, longer term impacts such as a greater number of visits to the same right-of-way, multiple site establishment costs, increased storm hardening, additional permitting and licensing costs, greater levels of environmental impact, and more disturbance to property abutters will be assessed. Further detail on specific asset condition programs and projects is provided below.

NY Inspection Repairs - (C026923, C093940, C093941, C093942 - $261.7M)

The goal of this program is to replace damaged or failing components on the transmission overhead line system identified during field inspections referred to as five-year foot patrols. Three divisional funding projects have been created for the three National Grid divisions (East, Central, and West). The three divisional funding projects have been created to ensure resourcing allocation and spending is dispersed appropriately across New York State.

Drivers:
This program ensures that both steel tower and wood pole transmission lines meet the governing NESC standards by replacing hardware, wood poles, and structure components that no longer

meet the code requirements. This follows standard industry practice and the Commission's 2005 Safety Order in Case 04-M-0159.[5]

Customer Benefits:
This program enhances public safety by assuring that damaged or failed transmission overhead line components are replaced and continue to meet the governing NESC under which they were built. Replacing damaged and failed components identified during inspection also promotes reliable service performance.

2023 to 2024 Variance:
The increase in forecasted capital spend is due to the age and deterioration of the wood pole fleet. Significant woodpecker damage and increased pole decay has led to an increase in rejected poles. Wood poles have been re-inspected using drone technology, and groundline inspections to understand the condition of our assets more thoroughly.

Table 2-27
Transmission – New York Inspection Projects
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	5.0	5.0	5.0	5.0	5.0	-	25.0
2024	-	23.0	52.4	59.9	67.5	58.8	261.7

Wood Pole Management - (C093908, C093909, C093910 - $5.4M)

This program assures that wood transmission circuits meet the governing NESC standards under which they were constructed by replacing wood poles and wooden structures that no longer meet the governing code requirements due to damage or failure of the pole or structure.

Drivers:
As discussed in the Report on the Condition of Physical Elements of Transmission and Distribution Systems (aka Asset Condition Report) filed on October 1, 2022, in Case 20-E-0380, wood poles that are either Priority Rejects or Reject poles, as classified following a wood pole ground line inspection and treatment, as well as those severely damaged by woodpecker or insect activity, need to be replaced. The ground line inspection and treatment of wood poles is performed approximately every ten years. These inspections are in addition to the five-year foot patrols required under the Commission's 2005 Safety Order in Case 04-M-0159. The wood pole replacements identified through this initiative are deemed to be beyond restoration by methods of treatment, usually at the ground line or by some form of additional pole support. Similarly, "reject equivalent", deteriorated wood poles due to severe woodpecker damage, insect damage, or rotting are also included in this program.

Reject and Priority Reject poles generally do not meet NESC strength requirements. In a limited number of cases when an extra margin of safety was included in the design, a portion of this margin may still be available before failing to meet the code. However, this usually provides only a limited amount of additional time to replace the damaged or deteriorated wood pole(s) or structures before potential failure.

[5] *Case 04-M-0159, Proceeding on Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems, Order Adopting Changes in the Electric Safety Standards (issued and effective Dec. 15, 2008, revised in March 2013) ("Safety Order").*

In FY24, this program was split into three regional funding project numbers (East, Central, and West) to allow for tracking of jobs based on region.

Customer Benefits:
The primary benefit of this program is improved public and employee safety. The combination of cyclical inspections and associated asset replacement work are the foundation for operating a safe, reliable, and adequate electric system. In addition to the public safety benefit, reducing unplanned failures of wood poles or structures can improve service reliability and overall system integrity by making the transmission system less vulnerable to disruption.

2023 to 2024 Variance:
Future spending levels are being adjusted downward to assist in zero balancing the overall transmission portfolio in the outer years. The priority rejects and rejects will be walked into the capital plan.

Table 2-28
Transmission – Wood Pole Management
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.1	1.1	1.1	1.1	1.1	-	5.5
2024	-	1.0	1.1	1.1	1.1	1.1	5.4

Battery Replacement Program (C033847 - $2.5M)

Battery and charger systems provide DC power within the substation. Batteries perform a critical function by ensuring protective relay and control systems can operate station breakers to isolate faults on the system.

Drivers:
National Grid's policy is to replace all battery sets that are 20 years old, or sooner, if battery conditions determined through testing and inspection warrant replacement. The 20-year asset life is based on industry best practice and Company experience managing battery systems.

Customer Benefits:
Battery systems are important for the proper operation and control of the protection schemes for transmission stations.

2023 to 2024 Variance:
Future spending levels are expected to remain mostly consistent with the prior Plan.

Table 2-29
Transmission – Battery Replacement Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.6	0.5	0.5	0.5	0.5	-	2.6
2024	-	0.5	0.5	0.5	0.5	0.5	2.5

Relay Replacement Program

Clay - 345kV relay replacement (C089255 - $1.2M)

Menands Cntrl Bldg & Relay Replcmt (C049601 - $6.4M)

Protective relays are maintained in accordance with Company substation maintenance standards and NERC or NPCC requirements, where applicable. Overall, the population of approximately 4,000 relay packages remains adequate, but approximately 6% of the population requires replacement based on condition, performance, or obsolescence. This program will replace the worst 6% of the relays over the next ten years. Beyond that, studies and pilot programs will be initiated to explore the most efficient and cost-effective approach to addressing the remaining population. The long-term objective is to have an asset management approach that allows a more commoditized approach to relay replacement. This approach will be necessary for modern microprocessor relays that are expected to have 15 to 20-year asset lives.

Drivers:
This strategy ensures that reliable protective relay systems are in place to maintain the reliability of the system and protection of the circuits and substation assets in case of a fault. This strategy is required because properly functioning protective relays are essential for rapid isolation of faults on the system, to limit customer interruptions and protect equipment from damage.

Customer Benefits:
Properly functioning elements of relay protection schemes limit the extent and duration of outages. Further, the protection system is designed to protect high-value assets against failure in the event of system anomalies, thereby reducing the potential investment needed to recover from an event. The primary benefit of this strategy will be to maintain the reliability performance of the system and customer satisfaction as known poor-performing relay families are replaced with modern microprocessor-based relays.

2023 to 2024 Variance:
The protection relays that are planned for replacement are reviewed and incorporated into other projects where possible or scope may be expanded upon project review at a substation.

Table 2-30
Transmission Relay Replacement Strategy
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	4.9	0.5	0.1	0.0	0.0	-	5.5
2024	-	3.9	2.5	0.1	0.2	0.9	7.6

Overhead Line Refurbishment Program

Over the next five years, the Company will refurbish or partially refurbish a number of overhead circuits based on their condition. During this period, we will continue to work towards an overhead line refurbishment approach that, to the greatest extent possible, addresses only elements in the most deteriorated condition. This approach only considers rebuilding an entire line when the conductor requires replacement. In general, during the Needs Assessment phase of the project, conductor testing will determine whether the conductor tensile strength fails to meet appropriate

National Electrical Safety Code ("NESC") load requirements. When possible, shield wire testing will also be performed.

For overhead lines with acceptable conductor strength, this program will assure that transmission circuits meet the minimum governing NESC under which they were built. This will be accomplished through the replacement of deteriorating structures and line components that no longer structurally or electrically adhere to the governing NESC.

The costs projected for overhead line work prior to the completion of Develop and Sanction are considered preliminary in nature. As part of Needs Assessment and Option Selection, an overhead line will be field evaluated, and refurbishment options more thoroughly evaluated on a case-by-case basis will be presented as part of Option Selection and Develop and Sanction. The value of various options (e.g., complete reconductoring versus a life extension) will be reviewed; however, cost estimates may continue to differ due to unforeseen circumstances, such as the need for additional swamp matting due to weather conditions, rising costs of materials, or other environmental requirements.

To reduce costs during the period of this Plan, the Company is implementing an approach recommended by Staff in the Company's 2010 rate case to refurbish only those overhead transmission circuit facilities that are in unacceptably deteriorated condition (i.e., National Grid's defined Level 1, Level 2 and Level 3 condition). Although this approach allows for reduced investment amounts in the five years covered by this Plan, the approach must be evaluated against longer term issues such as increased susceptibility to storm damage, additional permitting and licensing costs, greater levels of environmental impact, future capacity needs and more disturbance to abutters to determine the most economical solution to the benefit of customers and multiple visits to the same right-of-way, site establishment costs. Therefore, for certain overhead line condition projects, a larger work scope to replace assets that are deteriorated, yet serviceable, may be more appropriate and cost-effective.

This Plan assumes that Level 1, 2 or 3 issues identified during routine foot patrols will be addressed through the five-year foot patrols. Where the Company identifies a potential systemic problem, an engineering inspection and an aerial comprehensive survey will be initiated. Any issues arising from these condition assessments will be addressed through this overhead line refurbishment program.

The more significant overhead line refurbishment projects in this Plan are listed below. Additional details are included in Exhibit 5 – Overhead Line Refurbishment Projects.

Amsterdam-Rotterdam #3 & #4 69kV Relocation (C081471 - $1.2M)
Border City-Elbridge #15 (C075723 - $15.8M)
Brockport Taps ACR (C055531 - $25.6M)
Clay to Wetzel Tap (C069533 - $2.0M)
Curtis St - Teall #13 ACR (C084496 - $16.6M)
Feura Bush – N. Catskill 2 ACR (C083073 - $2.7M)
Gard-HH 151-152 T1950-T1280 S ACR (C027425 - $9.2M)
Greenbush – N Troy Corridor ACR (C094479 - $13.8M)
Huntley-Lockport #36 & #37 Ayer Rd ACR (C081670 - $13.5M)
Lockport-Mortimer #113 & #114 ACR (C081664 - $14.6M)
New Scotland-Feura Bush #9 / New Scotland-Long Lane #7 ACR (C084554 $21.5M)

Pannell-Geneva #4 & #4A (C030889 - $10.9M)
Rotterdam - New Scotland 19 ACR (C084588 - $37.1M)
South Oswego-Clay #4 T-334 Rebuild (C075544 - $2.4M)
Spier-Queensbury#5 ACR (C060210 - $1.2M)
Spier-Queensbury#17 ACR (C060211 - $1.2M)
Thompson-N Troy-Greenbush Corridor ACR (C081667 - $13.8M)

Drivers:
The Company has over 5,720 circuit miles of transmission overhead lines, and many of these assets are approaching, and some are beyond their expected design life. The program will ensure the Company's transmission circuits meet the minimum requirements of the governing code under which they were built as required by the Commission's 2005 Safety Order (Case 04-M-0159).

Customer Benefits:
This program promotes safety and reliability through replacement of deteriorating transmission structures and line components that no longer structurally or electrically conform to the governing NESC under which they were built.

2023 to 2024 Variance:
The Company re-phased a portion of the overhead line refurbishment projects to manage short-term capital investment as well as to accommodate other capital projects. Previously identified overhead line refurbishment projects were evaluated and, if the criteria were met, was identified as a MVT project to rebuild the line to a higher capacity. Overhead line equipment failures and any Level 1, 2 or 3 issues identified during inspection will be addressed through the five-year foot patrols or the Damage / Failure budget.

Table 2-31
Transmission – Overhead Line Refurbishment Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	61.9	62.5	133.7	180.2	166.0	-	604.3
2024	-	6.4	40.2	78.2	40.8	37.7	203.3

NY Transmission Underground ("UG") Strategy (C084550 - $7.3M)

Across upstate New York, National Grid has roughly 53 miles of UG transmission cable from 115kV to 345kV. These 53 miles are divided into two types of cable; 41.9 miles of high-pressure fluid filled ("HPFF") pipe type cable and 11 miles of solid (extruded) dielectric cable. The average age of the HPFF pipe type cable is 51 years with the oldest install dating to 1959. The average age of the solid dielectric cable is 19 years with the oldest install dating to 1988.

These assets are mostly original since their in-service date and the Company has taken the approach of fixing problems as they arise. However, as these assets continue to experience increased condition issues, maintaining them has become increasingly difficult and costly. The current condition and difficulty to repair and replace obsolete pipe-type cable equipment places the electrical system at risk and raises concerns for our employees and contractors. Increased inspection and maintenance are required to assure these assets continue to provide reliable electric service to our customers based in the deteriorating asset condition.

The goal of this program is to address asset condition issues as these assets reach, or exceed, the end of their useful life and failure risk is high. The determination of the need for cable replacements will be through critical load assessments and the increased inspection and maintenance program results.

Drivers:
This program is driven by deteriorating UG infrastructure, risk mitigation, and the obsolescence of assets. Increasing the inspections and maintenance of the UG transmission system will give us the full picture of our asset health and allow us to make the most efficient investment decisions moving forward.

Customer Benefits:
Addressing asset issues on transmission UG infrastructure as condition deteriorates is necessary to maintain safe and reliable electric service to customers. When necessary, replacing pipe-type cables with solid dielectric cables mitigates risks associated with single cable manufacturer, limited resources to repair the cable, and difficulty in obtaining spare equipment.

2023 to 2024 Variance:
Variance relates to more time needed to develop and implement a robust inspection program to properly assess and rank the Company's UG transmission system. Specific capital projects are expected to begin in FY29.

Table 2-32
Transmission – NY Transmission UG Strategy
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.3	1.0	1.0	-	2.3
2024	-	0.0	0.3	1.0	1.0	5.0	7.3

Worst Performing Circuits – NY (C084553 - $17.5M)

The worst performing circuit program specifically addresses the cause of the transmission circuit being on the worst performing list. These are typically short turnaround projects that have the potential to improve the circuits' reliability. Projects typically include targeted re-insulating, grounding/bonding replacements, and potentially upgrading switches with remote control motor operated devices ("RC-MOD"). These RC-MODs would be operated remotely from the Transmission Control Center ("TCC"). RC-MODs avoid the need for a Traveling Operator to visit the disconnect switch to operate it. There is also a specific program for RC-MOD installations.

Drivers:
The key driver of this project is to improve customer reliability associated with interruptions on these specific circuits.

Customer Benefits:
The key benefit to customers is improvement in both the short-term and long-term reliability of the system by focusing on the primary causes of transmission events.

2023 to 2024 Variance:
This program was not in the 2023 plan.

Table 2-33
Transmission – NY Worst Performing Circuits
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	5.0	5.0	5.0	-	15.0
2024	-	0.0	2.5	5.0	5.0	5.0	17.5

Transformer Replacement Strategy

Substation transformers are managed through routine visual inspection, annual dissolved gas analysis ("DGA") and electrical testing, where required. Transformers with load tap-changers are also maintained in accordance with our substation maintenance standards.

In the event of a transformer failure, a supply of strategic spares is available for the majority of the fleet.

Transformer Spare 115/23kV, 50 MVA (C081732 - $2.6M)

The procurement of a 115/23kV, 50 MVA spare transformer to be stored on a National Grid site helps to maintain reliability if an in-service transformer develops issues which may require de-energization, reduces outage duration in the case of a unit failure, and reduces lead time in-case there is an issue with logistics/manufacturing concerns.

Drivers:
The driver of this project is due to long manufacturing lead times.

Customer Benefits:
The impact of substation transformer failure events on customers could cause a long-term outage. These critical spare assets are necessary to respond to unpredictable events or failures to maintain reliable network operation.

2023 to 2024 Variance:
The variance is due to timing adjustments to accommodate other capital projects and, where possible, to combine with substation rebuild and/or support local planning projects.

Table 2-34
Transmission – Transformer Replacement Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	0.0	0.4	1.0	0.0	-	1.4
2024	-	0.0	0.6	0.6	1.4	0.0	2.6

Breaker Replacements

Dewitt-Replacement 345kV CB R130 (C093056 - $1.8M)
Scriba – Replacement CB R200 (C093255 - $1.2M)

The 345kV circuit breakers ("CB") at Dewitt Station and Scriba Station are GCBs and have deteriorated over their lifetime, have SF6 leaks, have limited-to-no spare parts, and have limited-to-no OEM support.

Drivers:
The proactive replacement of deteriorated assets that have limited-to-no spare parts and limited-to-no OEM support.

Customer Benefits:
The planned replacement of this substation equipment reduces the likelihood of an in-service failure which could lead to long-term interruptions of the transmission system as well as significant customer outages.

2023 to 2024 Variance:
These projects are new to the 2024 plan.

Table 2-35
Transmission – Breaker Replacements
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.7	0.7	1.6	0.0	0.0	4.0

Circuit Breaker Replacements

The circuit breaker population is managed through routine preventative maintenance activities per substation procedures. During the plan, obsolete circuit breakers will be replaced with modern equivalent circuit breakers. Typically, in the past, these breakers would be replaced with circuit breakers employing SF6 gas as an arc interrupting medium. The Company has begun to adopt lower global warming potential circuit breakers such vacuum or alternate gas based on a criteria that considers criticality of the location and the time needed to evaluate new technology from manufacturers through in-service trials.

Drivers:
There are 793 circuit breakers used within the service territory are categorized as gas or oil for 69kV and above voltage levels. There are OCBs and GCBs which indicate poor condition due to oil or SF6 gas leaks, bushing hot spots, high power factors, limited/no spare parts, and limited/no OEM support. There have also been failures of gaskets, pressure valves, hoses, gauges, motors, compressors, pulleys, O-rings, control cables, trip coils, close coils, lift rods and contacts.

Customer Benefits:
The planned replacement of circuit breakers reduces the likelihood of an in-service failure which could lead to long-term transmission interruptions as well as customer outages. The circuit breaker replacement strategy promotes reliability of the transmission network.

2023 to 2024 Variance:
The variance is due to some of these projects being bundled with other station upgrades, while some projects will remain as stand alone. The standalone project(s) are listed below:

Packard Station (C079222 - $1.5M)

Two OCB replacements – OCBs that have deteriorated over their lifetime, have limited-to-no spare parts and limited/no OEM support.

Table 2-36
Transmission – Circuit Breaker Replacements
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	0.5	0.7	0.0	0.0	-	1.6
2024	-	0.2	0.8	0.5	0.0	0.0	1.5

345kV Laminated Cross-Arm Replacement Program

Scriba-Volney 20/21 Lam Arm/ACR (C093004 - $20.1M)

This project will address the deteriorating condition of 345kV laminated crossarms and wood pole structures on the 345kV Scriba – Volney 20/21 lines in Central NY. These lines run parallel to one another and are both 8.8 miles long. NY Transmission Asset Management has decided to replace all deteriorating wooden H-Frame suspension structures on the lines (90 structures) with direct embedded steel structures. The incremental cost that comes with replacing the structure when compared with replacing a crossarm is minimal after considering the labor, matting, and equipment costs.

Five Mile - Stolle Rd 29 Lam Arm (C093153 - $42.5M)

This project will address the deteriorating condition of 345kV laminated crossarms and wood pole structures on the 345kV Five Mile - Stolle Rd 29 line in Western NY. The 345kV Five Mile - Stolle Rd 29 includes 25.17 miles of 345kV structures with laminated cross arms. Based on the most recent inspections, NY Transmission Asset Management has identified 28 wooden H-Frame structure replacements, nine insulator replacements, and five bonding replacements on the line.

Drivers:
The 345kV New Scotland–Alps 2 line has experienced two failures on tangent (D-1501) structures in prior years. The identified root cause is ageing wood laminated cross arms used to support suspension insulators. These specific laminated cross arms were used by National Grid prior to approximately 1975.

Several D-1501 wood cross arm samples were obtained from structures replaced along the 345kV New Scotland-Alps 2 line due to normal maintenance. These cross arms were destructively tested in the field by forcing a shear failure parallel to their lamination. Once split, the laminations were examined for glue adhesion quality. Concurrently, samples were sent to the State University of New York College of Environmental Science and Forestry (“SUNY-ESF”) for laboratory analysis. SUNY-ESF performed mechanical testing on large length samples to measure and compare their bending strengths to the original design specifications. The results indicated the in-service cross arms were weaker than specifications.

A related aerial inspection also identified deteriorated cross arms and overstressed vee braces for D-1501 structures constructed prior to 1975. This multi-year Plan will initially investigate structures at road crossings and then systematically evaluate remaining structures.

Customer Benefits:
This program promotes transmission reliability through the planned replacement of laminated cross arms that are deteriorated and no longer structurally or electrically conform to their design specifications.

2023 to 2024 Variance:
The variance in this program has been due to the increased severity of defects found in the field. Engineering will take place in FY25 and FY26 for projects that will be constructed in the outer years.

Table 2-37
Transmission – Laminated Cross-Arm Replacement
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	17.1	10.0	10.0	15.0	15.0	-	67.1
2024	-	0.4	2.3	19.6	18.4	21.9	62.6

Priority Overhead Line Transmission Switch Replacement Program (C093902, C093904, C093905 - $31.3M)

This program will address disconnect switches in need of replacement, prior to complete failure, to maintain system reliability and operability. These switches are identified and prioritized by the Transmission Control Center ("TCC").

These switches have been identified as a need by the Transmission Control Center and agreed to by the Transmission Overhead Line Priority Switch Replacement team which meets quarterly. The goal is to remain proactive in replacing identified line switches, so they are operable when called upon to avoid an emergency damage/failure situation for a switch replacement.

This job was split into three divisional funding project numbers (East - C093905, Central - C093904, and West - C093902) to allow for easier tracking of jobs. The former funding project number C076621.

For FY24 and onwards, 115kV switches previously charged under C076621 funding project numbers are:

- New Scotland – Long Lane 7 (switch 711)
- Coffeen – West Adams 2 & Coffeen – Lighthouse Hill 5 (switch X2L5)
- Menands – Riverside 3 (switch 311)
- Black River – Lighthouse Hill 6 (switches X6-1 and X6-2)
- Ticonderoga – Republic 2 (switch 211)
- Huntley – Lockport 36/37: Tonawanda Creek (switches 41 and 42)
- Dunkirk – Falconer 160 (switches 720 and 722)
- Geres Lock – Solvay 2 (switch X2-1)
- Colton – Malone 3 (switch X3-1)
- Dennison – Colton 4 (switch X4-2)
- Colton – Browns Falls 1 (switch X1-1)
- Feura Bush – North Catskill 2 (switch 211)
- Oneida – Fenner 8 & Fenner Cortland 3 (switch X3K8).

Drivers:
Leaving tagged switches inoperable for long periods of time, or removing them, leaves the transmission system operationally deficient and less flexible. In many cases, this is not acceptable for emergency system operations.

Customer Benefits:
The primary benefit is improved reliability to our customers. By replacing older, non-functioning switches, the functionality of the switch will be increased, which will in turn increase the reliability of the line, allowing customers to be brought back online quicker. The efficient operation of transmission line switches allows for improved emergency system restoration. Additionally, adding a RC-MOD provides the field switch supervisory control functionality. This gives the Transmission Control Center (TCC) the ability to operate a field switch remotely, which has the potential to isolate faults and bring back customers, quickly. Finally, by replacing the old switches, the safety experienced by the line crews who operate these switches will be improved.

2023 to 2024 Variance:
This program is progressing as planned with variances due to material costs and budget balancing with other projects. Starting in FY26 and onwards, more funding will be allotted for additional switch replacement projects.

Table 2-38
Transmission – Priority Line Switch Replacements
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	4.3	2.0	2.0	1.9	1.9	-	12.1
2024	-	0.2	4.4	8.9	8.9	8.9	31.3

Browns Falls Station – Asset Separation/Replacement (C081427 - $11.9M)

The Browns Falls Station is a 115kV – 34.5kV interconnection point with Brookfield Power. The 34.5kV assets in the lower 34.5kV yard are in poor condition and have caused potential safety and clearance concerns. There are four 34.5kV OCBs in service that are in poor condition, lack OEM support, have mechanism issues, and are part of the New York 69kV to 4kV Oil Circuit Breaker Replacement Strategy.

This project will expand the 115kV yard fence to allow for the installation of a new metalclad for the 34.5kV equipment as well as the relocation of the 115kV relay and controls from the Brookfield Powerhouse. The 115kV circuit breakers were recently replaced and are in good condition.

Drivers:
The OCBs are in poor condition. There is a lack of spare parts and maintenance support from the OEM. The separation of the assets from those owned by Brookfield Power allows for equipment access in the event of an emergency or planned maintenance.

Customer Benefits:
The planned replacement of these assets reduces the likelihood of failures and customer outages.

2023 to 2024 Variance:
This project is progressing as planned.

Table 2-39
Transmission – Browns Falls – 115kV Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.8	2.4	1.9	1.6	0.4	-	8.1
2024	-	6.2	3.4	2.3	0.0	0.0	11.9

Inspections Identified Replacement Program (C082106 - $1.5M)

This program addresses replacement of overhead line components found by inspection outside of the mandatory foot patrol inspections and the wood pole management program such as the post-fault aerial patrol.

Drivers:
This program addresses deteriorated overhead line issues found through alternative inspection methods.

Customer Benefits:
This program will enhance the reliability of our 115kV system.

2023 to 2024 Variance:
This program is progressing as planned.

Table 2-40
Transmission – Inspections Identified Replacement
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.3	0.3	0.3	0.3	0.3	-	1.5
2024	-	0.3	0.3	0.3	0.3	0.3	1.5

Yahnundasis Station: Asset Replacements (C081794 - $19.9M)

Yahnundasis Substation is a 115kV, 46kV and 13.2kV substation. The 115kV and 13.2kV bus are designed as a straight bus configuration and the 46kV bus is designed as a main and transfer configuration. The assets located at the substation are in deteriorated condition, have limited spare parts and limited-to-no OEM support. In addition, the original oil filled assets have a history of leaks.

The 46kV relays and controls in the control house are obsolete, have limited spare parts and are limited-to-no OEM support.

The 13.2kV relay and controls are constructed within a metal clad that are obsolete, have limited spare parts, limited OEM support and the metal clad switchgear is in poor condition.

The Yahnundasis Substation project is planned to replace deteriorated assets at the 115kV, 46kV and 13.2kV voltage levels which includes OCBs, VCBs, disconnect switches, insulators, PTs, two 115/46kV transformers, one 115/13.2kV transformer and one 15kV metal clad switchgear.

The metal-clad is planned to be built as an open-air design.

Drivers:
Assets that are in poor condition will be replaced. OCBs and protection and control systems lack spare parts and lack OEM support to maintain them.

Customer Benefits:
The proactive replacement of deteriorated assets will maintain reliability of the electric system.

2023 to 2024 Variance:
The project is progressing forward, and the review of the project indicated a higher total cost due to an updated estimate and the complexity with the project cutover sequencing.

Table 2-41
Transmission – Yahnundasis: Asset Replacements
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	0.7	2.0	6.2	5.8	-	14.8
2024	-	0.4	0.6	1.5	8.4	9.0	19.9

Youngman Terminal – Asset Replacement (C079465 - $13.0M)

The Youngman Terminal project is to replace deteriorated assets, that have limited/no spare parts, limited/no OEM support and the Oil filled assets have had leaks. The assets to be replaced include 115kV and 34.5kV voltage levels.

The 115kV assets that are to be replaced are one circuit switcher ("CS") and two 115/34.5kV transformers. The 34.5kV assets that are to be replaced are five OCBs, six VTs, six surge arresters ("SA"), and six station service transformers.

Drivers:
If deteriorated assets are not replaced, they could fail unexpectedly and could cause a long-term outage.

Customer Benefits:
The proactive replacement of deteriorated assets will maintain reliability of the electric system.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-42
Transmission – Youngman Terminal - Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.1	0.9	6.0	6.0	13.0

Spier-Rotterdam 2 Re-Insulate (C081676 - $9.3M)

This project ("Phase 2") will address asset condition related issues of the legacy 115kV Spier-Rotterdam 2 line from structure 113 to Rotterdam station. This line is now split into the 115kV Spier Falls–Lasher Rd. 2 (T7080) line and the Rotterdam–Luther Forest 44 (T7090) line. This

circuit still has insulators and hardware from the original line installation. A portion of the line was re-insulated under Phase 1 of this project and there have been spot replacements when equipment has failed, but a total refurbishment has not been completed.

Drivers:
The insulators on these lines are in poor condition and will be upgraded to toughened glass. There have also been several reliability events on these lines over the past five years.

Customer Benefits:
The proactive replacement of deteriorated assets will maintain reliability of the electric system.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-43
Transmission – Spier-Rotterdam 2 Re-Insulate
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	9.3	0.0	0.0	0.0	0.0	9.3

Station 078: Asset Replacement (C081792 - $25.1M)

The Tonawanda Terminal Station 078 was originally constructed in the early 1950s. The substation consists of 115kV, 23kV and 5kV voltage yards. The substation consists of assets that have deteriorated over their lifetime, have limited/no spare parts, limited-to-no OEM support and with some assets original to the substation.

The 115kV assets that are to be replaced are two 115/23kV transformers (TRF 1 and TRF 4) and two 115/4.16kV transformers.

The 23kV assets that are to be replaced are nine 23kV OCBs (R472, R462, R392, R372, R362, R272, R192, R182 and R172).

Two 4.16kV Circuit Breakers are looking to be replaced with a metal clad switchgear.

Drivers:
Asset Condition is the primary driver of this project with multiple deteriorated assets needing to be replaced. If not replaced, unexpected failures may occur which may cause prolonged outages for multiple customers.

Customer Benefits:
The proactive replacement of deteriorated assets to maintain reliability of the electric system.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-44
Transmission – Station 078: Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.2	0.9	9.0	15.0	25.1

Golah-N. Lakeville 116 Priority 2 Str (C086697 - $3.9M)

An aerial inspection conducted in 2022 identified multiple structures on the 115kV Golah–North Lakeville 116 line that have woodpecker damage and insulator deterioration. To solve the immediate concerns on the line, the wood poles with the most severe damage will be replaced.

Drivers:
Resiliency is the primary driver for this project.

Customer Benefits:
Replacing these structures improves system asset health and will reduce the likelihood of structure failures in order to maintain the reliability of the line.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-45
Transmission – Golah-NLakeville#116 Priority 2 Str
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.1	0.3	0.5	3.0	0.0	3.9

153/154 Str. 308 Access Improve (C090061 - $1.1M)

During a previous reinsulating project on the 115kV Falconer–Homer Hill 153/154 lines to improve reliability, structure 308 was identified as located in an inaccessible location. Structure 308 supports one of the longest spans in NY at nearly 2000 feet across the valley, and maintenance has been postponed due to those access constraints. This project will improve access and stabilize the area around structure 308 so that tower maintenance can occur.

Drivers:
These circuits are being reinsulated to improve reliability. Improving access to structure 308 will allow completion of the maintenance and reinsulating on these circuits.

Customer Benefits:
This project will allow for future maintenance on this structure, which will maintain reliability for the 153/154 lines.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-46
Transmission – 153/154 Str. 308 Access Improve
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.2	0.9	0.0	0.0	0.0	1.1

Remote End Transmission Work for South Eden (C090456 - $1.2M)

A new greenfield distribution substation, South Eden Station (34.5-13.2kV), is being built which has sub-transmission connections to three transmission substations, North Ashford Station, Bagdad Station, and North Angola Station. These transmission substations require remote end work including relay replacements to support the new line configuration due to the new distribution substation.

Drivers:
This project supports the associated new 34.5-13.2kV South Eden Station near the existing Eden switch structure as well as the construction of new feeders to address loading and reliability concerns in the area.

Customer Benefits:
This project addresses component fatigue and asset condition needs while supporting the needs of the new substation.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-47
Transmission – Remote End Transmission Work for South Eden
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.8	0.4	0.0	0.0	1.2

Newtonville Area Study

Maplewood (C091024 - $5.3M)

This project will install a new 115/13.2kV, 40MVA transformer at the Maplewood Station. This is one of several projects within the Newtonville Area Study supporting the retirement of the Newtonville Station.

Drivers:
There are numerous aging assets surrounding the Newtonville area needing replacement in the next five years based on substation asset condition reports. Additionally, assets are nearing their Summer Normal rating. Being a more urban environment, EV adoption is forecasted to be high with minimal opportunity for large, distributed energy resources for load mitigation. Lastly, Newtonville Station is a 4.16kV island requiring bottlenecked, ratioed field ties, which may lead to

reliability issues for customers due to the limited amount of load that can be transferred to neighboring feeders.

Customer Benefits:
Improved reliability, resiliency, and hosting capacity.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-48
Transmission – Newtonville Area Study: Maplewood
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	1.1	1.8	2.1	0.3	5.3

Lake Colby – Asset Replacement (C091042 - $8.6M)

The Lake Colby Station project is to replace deteriorated assets, that have limited-to-no spare parts, limited-to-no OEM support and the oil filled assets have had leaks. The assets to be replaced include 115kV, 46kV, 15kV voltage levels.

115kV assets that are to be replaced are the monitor and control system for the Static Var Compensator ("SVC"), two 115/46kV, 18/24/26.8 MVA transformers and one 115/13.2kV, 12/16/22.4 MVA transformer and one 115kV OCB.

46kV assets that are to be replaced are two 46kV OCBs.

15kV assets that are to be replaced are two 15kV OCBs.

Drivers:
The replacement of deteriorated assets that if not replaced would continue to deteriorate and could fail unexpectedly and cause a long-term outage.

Customer Benefits:
The proactive replacement of deteriorated assets to maintain reliability of the electric system.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-49
Transmission – Lake Colby – SVC Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.1	1.5	4.0	3.0	8.6

Trinity Pumping Plant Refurb (C091980 - $1.2M)

The Trinity Pressurizing Plant, manufactured in 1965, are necessary to circulate insulating oil in four 115kV underground cables in the Albany area. The pressurizing plant is equipped with four pumps and the pump starts occurrences more frequent than any other plant in our service territory. This project will replace the existing pumping plant.

Drivers:
In recent years, the pressurizing plant has experienced more frequent operational issues causing National Grid to hydraulically move circuits off nonfunctional ladders to functional ones. The frequency of equipment failure has been increasing which impacts reliability and is an end-of-life sign. The block ladders inside the pumping plant are an obsolete design and the lack of available replacement parts for failed components is a concern. The hydraulic return piping is 1" pipe and the relief valves are ¾" relief valves. The combination of the two has caused operational issues during extremely cold weather operation. Without the pumps in operational condition, there is the potential need to de-rate the 115kV underground cables impacting the ability of transmission system to operate at designed.

Customer Benefits:
This pumping plant serves four 115kV underground 115kV cables in the Albany region and the refurbishment will help ensure safe and reliable service going forward.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-50
Transmission – Trinity Pumping Plant Refurb
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.2	0.0	0.0	0.0	0.0	1.2

Mill St Station Rebuild (C093267 - $1.9M)

This project provides for the rebuild of the 23-4.8kV Mill Street Station that was built in 1956 and includes supply to six distribution feeders and to another six feeders that supply the low voltage network in Watertown.

Drivers:
Mill St. Station is in a deteriorated condition including the 23/4.8kV transformers, the voltage (instrument) transformers and the station service transformer. Additional equipment is also deteriorated and needs to be replaced. The substation is also located in another company's building and needs to be relocated.

Customer Benefits:
This project addresses component fatigue identified in the asset condition report. This project is adjacent to the Black River in the City of Watertown. Rebuilding the substation mitigates against environmental risks and reliability risks due to the failure of a station transformer.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-51
Transmission – Mill St Station Rebuild
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.1	0.3	1.5	1.9

Dunk-Falconer 160: 15 Str Replacements (C093930 - $1.6M)

An inspection and maintenance ("I&M") review on the 115kV Dunkirk–Falconer 160 line identified 58 structures that need replacement. After further review of the structures and their matting path, an additional 15 structures were identified by Transmission Line Services ("TLS") due to their location on the matting path and asset condition. Transmission Asset Management confirmed the asset condition concerns on the 15 structures via aerial inspection and will include them in the construction of I&M replacements.

Drivers:
The primary drivers of this project are resiliency and reliability. The structures have a higher risk of failure due to their deteriorated condition, and high woodpecker activity, and there is a history of trips and faults on this line. Replacing these structures will address these issues.

Customer Benefits:
This project will increase line resiliency against adverse weather and maintain line reliability. Project efficiencies are gained as the structures are along the same matting path of the I&M replacement project. Replacing the structures during the I&M replacement project, while there's matting access and active construction near them, will be a cost savings to customers.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-52
Transmission – Dunk-Falconer 160: 15 Str Replacements
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.2	0.4	0.0	0.0	0.0	1.6

Transmission Substation Physical Security (C093611 - $4.6M)

These projects are required to complete necessary work pertaining to NERC CIP-014 transmission planning requirements for physical security.

Drivers:
To ensure the physical security of substations to enhance reliability of the electrical system.

Customer Benefits:
The enhanced reliability of the electrical system per upgraded physical security projects.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-53
Transmission – Substation Physical Security
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.3	0.3	2.0	2.0	4.6

Deerfield Substation: Asset Replacements (C081797 - $11.4M)

Deerfield Station is a 115kV, 46kV and 13.2kV substation. The 115kV, 46kV and 13.2kV bus presently are designed as a straight bus configuration. The assets located at the substation are in deteriorated condition, have limited spare parts and limited-to-no OEM support. In addition, the original oil-filled assets have a history of leaks.

The 46kV relays and controls in the control house are obsolete, have limited spare parts and limited-to-no OEM support.

The 13.2kV relay and controls are constructed within a metal clad that are obsolete, have limited spare parts, and limited OEM support. The metal clad switchgear is in poor condition.

The Deerfield Substation project is planned to replace deteriorated assets at the 115kV, 46kV and 13.2kV voltage levels which includes OCBs, VCBs, disconnects, insulators, potential transformers, one 115/13.2kV transformer and one 15kV metal clad.

Drivers:
The assets are in poor condition. The OCBs lack spare parts and necessary maintenance support.

Customer Benefits:
The proactive replacement of deteriorated assets to maintain reliability of the electric system.

2023 to 2024 Variance:
The project is progressing forwards and from team reviews the scope was further defined and cost was adjusted accordingly.

Table 2-54
Transmission – Deerfield: Asset Replacements
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	0.3	1.0	3.9	2.9	-	8.2
2024	-	0.4	0.7	0.9	4.6	4.8	11.4

Warrensburg - Scofield Road 10 (C086755 - $1.0M)

This project will rebuild the 115kV Warrensburg-Scofield Road 10 line and a portion of the 115kV Spier–West 9: Scofield Road tap in the Northeast Region. The total length of the project is 14.88 miles. The lines primarily consist of wood pole davit arm structures and wood pole H-frame structures.

Drivers:
Following a crossarm failure in 2020, an aerial comprehensive inspection and a field walk down were performed, and numerous defects were found. A large portion of the wood structures were found to need replacement.

Customer Benefits:
Replacing these structures improves system asset health and will reduce the likelihood of structure failures, maintain reliability, and bring these lines to current standards.

2023 to 2024 Variance:
This project has been pushed out in the plan and the project scope has increased.

Table 2-55
Transmission – Warrensburg - Schofield Rd 10
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	2.3	0.0	-	2.3
2024	-	0.0	0.0	0.1	0.4	0.5	1.0

New Scotland R93&R94 Asset Replace (C062752 - $15.3M)

The 345kV Gas Circuit Breakers (“GCBs”) are in deteriorated condition, have leaked SF6 gas, and have limited spare parts and limited OEM support.

Drivers:
The assets are in poor condition. The Gas Circuit Breakers (GCBs) lack spare parts and necessary maintenance support.

Customer Benefits:
The project replaces assets in poor condition and will help maintain system reliability.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-56
Transmission – New Scotland R93&R94 Asset Replace
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.1	0.8	1.3	1.0	-	3.2
2024	-	0.1	1.6	5.3	4.3	4.0	15.3

Solvay: Asset Replacement (C079463 - $19.9M)

The Solvay Station has 115kV and 34.5kV voltage levels. The assets are in poor condition specifically, the 115kV circuit switchers, 115/34.5kV transformers, 34.5kV OCBs, potential transformers and the protection and control system.

The two 115kV circuit switchers have limited spare parts, and limited OEM support.

The four 115/34.5kV transformers have a history of leaks, are individual phase units, and have limited-to-no spare parts and limited-to-no OEM support.

There are 10 34.5kV OCBs in service that are in poor condition, lack OEM support, have mechanism issues, and are part of the New York 69kV to 4kV Oil Circuit Breaker Replacement Strategy.

The control house is of cinder block construction and has degraded over its lifetime. In addition, there are cracks which allow for water and insect intrusion.

There are obsolete protection relays and controls within the control house.

Drivers:
The assets are in poor condition. The OCBs lack spare parts and necessary maintenance support.

Customer Benefits:
The project replaces assets in poor condition and will maintain system reliability.

2023 to 2024 Variance:
The project is progressing forward and during the conceptual review the estimate was revised for scope and higher material costs.

Table 2-57
Transmission – Solvay: Replacement Circuit Switchers
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.1	0.8	6.5	5.5	-	12.9
2024	-	0.1	0.7	7.5	7.5	4.0	19.9

Gardenville - Five Mile 151&152 Culverts 24 26 31.2 41.2 (C087617 - $3.2M)

This project is associated with Project C086795, the Gardenville–Five Mile Culvert Replacements. C087617 is one of the specific FP's for addressing failed culverts. It will address four high-priority/failed culverts in the Gardenville-Five Mile 151/152 corridor. The Gardenville – Five Mile Culvert Replacement project, C086795, was created to encompass the estimates and inspection cost of all the damaged culverts. As each individual or group of culverts progress through engineered a new specific funding project is generated.

The Gardenville-Five Mile 151/152 line road culvert has a program placeholder funding project ("FP") of C086795 containing all future year forecasts. As projects go from Gate B to Gate C the specific FP for the specific culverts is credited and the placeholder forecast is debited.

Drivers:
Presently, with the culverts and wing walls failing or failed, fine-grained soils mix with storm water and potentially could reach Eighteen Mile Creek which is a NYSDEC Class A stream. If a culvert fails, allowing turbidity to reach Eighteen Mile Creek, it could impact water quality and potentially affect fish and wildlife.

Customer Benefits:
The community is supportive of this project as many of them over the past few years have been affected by flooding caused by inadequately sized or plugged culverts. The community would benefit from the conservation of a clean Eighteen Mile Creek. This ensures that fish and wildlife are not disrupted from the failure of a culvert.

2023 to 2024 Variance:
Project is progressing; however, the culvert replacements originally scheduled for FY23 have been deferred by one year to FY24 based on project priorities.

Table 2-58
Transmission – Gardenville 5 Mile 151&152 Culverts 24 26 31.2 41.2
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.2	2.8	0.2	0.0	0.0	-	3.2
2024	-	0.0	0.0	0.0	0.0	3.2	3.2

Knapp Road Storage Building (C083804 - $1.5M)

This project is for the installation of an indoor storage barn and an outdoor storage yard for transmission line project materials.

Drivers:
Currently, property is leased for capital projects on an as needed basis to store materials and equipment. Constructing the Knapp Road Storage building which is strategically located between the western and central divisions on Company owned land is expected to be a lower cost solution for customers. This storage facility will also be able to store spare transmission line materials for use in the event of a failure.

Customer Benefits:
Storing spare materials, as well as materials for capital projects in a centralized location, will allow crews to respond to emergencies more quickly. There will also be savings by not leasing additional property to support other capital work.

2023 to 2024 Variance:
Due to project prioritization, this project was moved from FY24 to FY25 to allocate funds for projects of higher importance.

Table 2-59
Transmission – Knapp Road Storage Building
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.8	0.0	0.0	0.0	0.0	-	1.8
2024	-	1.5	0.0	0.0	0.0	0.0	1.5

Bristol Hill - Asset replacement (C084072 - $9.2M)

Bristol Hill Station has voltage levels of 115kV and 34.5kV which has a mix of original and replaced assets. The 115kV and 34.5kV busses are presently designed as a straight bus configuration with one 115/34.5kV transformer. The original assets in the substation are in deteriorated condition, have limited spare parts and limited-to-no OEM support. In addition, the original oil filled assets have had a history of leaks.

The 115kV asset that is targeted for replacement is one 115/34.5kV transformer.

The 34.5kV assets that are targeted for replacement are one 34.5kV OCBs, two 34.5kV station service transformers ("SST"), and three 34.5kV VTs.

The protection and control equipment associated with the power transformer and circuit breakers is to be replaced since they are obsolete with limited spare parts and OEM support.

Drivers:
The assets are in poor condition. The OCBs lack spare parts and necessary maintenance support.

Customer Benefits:
The project replaces assets in poor condition and will help maintain system reliability.

2023 to 2024 Variance:
This project is progressing forward and during the conceptual review the estimate was revised for scope and higher material costs.

Table 2-60
Transmission – Bristol Hill - R20 replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.1	0.2	5.0	-	5.3
2024	-	0.0	0.0	0.2	5.0	4.0	9.2

Mallory 115kV Breakers & Control House (C084074 & C091198 - $6.7M)

This project will install two 115kV breakers and associated equipment at Mallory Station to allow for the sectionalizing of the 115kV Lighthouse Hill-Clay 7 line as it loops in and out of the substation.

Drivers:
The performance of the 115kV Lighthouse Hill-Clay 7 line is relatively poor, and outages of this circuit can result in extended outages to the customers served from the Mallory Station.

Customer Benefits:
Improved reliability and resiliency to those customers supplied by Mallory Station.

2023 to 2024 Variance:
This project is progressing as planned.

Table 2-61
Transmission – Mallory 115kV Breakers & CH
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	0.4	0.5	1.4	2.4	-	5.1
2024	-	1.5	4.1	1.1	10.0	0.0	6.7

Clay Substation 115kV Spare Bay Tap (C084077 - $1.4M)

This project installs less than ½ mile of 115kV transmission to create a new source for the Wetzel Road Tap 7. The existing connection to the 115kV Lighthouse Hill-Clay 7 line will be removed.

Drivers:
This is a Resiliency project to improve the quality of supply to Wetzel Road Station.

Customer Benefits:
The customers at Wetzel Road will see improved reliability due to less exposure to faults on the 115kV Lighthouse Hill-Clay 7 line.

2023 to 2024 Variance:
This project is progressing as planned.

Table 2-62
Transmission – Clay Substation 115kV Spare Bay Tap
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.6	0.3	0.0	0.0	0.0	-	0.0
2024	-	1.4	0.0	0.0	0.0	0.0	1.4

McIntyre-Colton 8 Reinsulate Structures 275-359 (C086662 - $4.7M)

This project replaces insulators between structures 275 to 359 on the 115kV McIntyre–Colton 8 line. This project will replace all remaining insulators on this corridor from the Colton Station to the McIntyre tap point at structure 226.

Drivers:
There have been multiple faults on this line due to insulators and conductor hardware being in poor condition.

Customer Benefits:
Replacing the insulators and conductor hardware on the remaining sections of the line will maintain reliability on the line.

2023 to 2024 Variance:
This project is progressing as planned.

Table 2-63
Transmission – McIntyre-Colton 8 Rein. 275-359
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	4.7	-	4.7
2024	-	0.0	0.0	0.0	4.7	0.0	4.7

Gardenville 230kV Station - Asset Replacement (C089270 - $8.9M)

The Gardenville 230kV Station has a mix of original and replaced assets. The 230kV bus is presently designed as a straight bus configuration with three bus circuit breakers and three 230/115/13.2kV autotransformers. The 230kV substation is connected to a 115kV substation located in a separate yard nearby. The 115kV substation was recently replaced along with the transformers.

The original assets in the 230kV substation are in deteriorated condition, have limited spare parts and limited-to-no OEM support. In addition, the original oil filled assets have had a history of leaks.

The 230kV assets that are targeted for replacement are nine OCBs, nine bus VTs, six PTs, and 15 Surge Arresters

The protection and control equipment associated with the Power Transformer and Circuit Breakers are also to be replaced since they are obsolete with limited spare parts and OEM support.

The land has recently had some water ingress and the grade will be adjusted to reduce the risk of water ingress and reduce the possibility of soil erosion occurring over time.

Drivers:
The assets are in poor condition. The OCBs lack spare parts and necessary maintenance support.

Customer Benefits:
The project replaces assets in poor condition and will help maintain system reliability.

2023 to 2024 Variance:
The timeline was adjusted based upon additional review of the project scope and duration to complete.

Table 2-64
Transmission – Gardenville 230kV - Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.5	12.3	-	12.8
2024	-	0.0	0.0	0.1	0.7	8.0	8.9

Lafayette-Clarks Corner 4-46 Str 39 (C090652 - $12.5M)

While Transmission Line Services (TLS) were performing maintenance work on the 345kV Lafayette-Clarks Corners 4-46 line, TLS identified wood H-Frame structure 39 to be in a

deteriorated condition and should be replaced. Additional inspections were performed on the line, and it was determined that approximately 16 structures will need to be replaced with steel.

Drivers:
These structures are deteriorated and need to be replaced.

Customer Benefits:
Replacing these structures will maintain reliability.

2023 to 2024 Variance:
This project is progressing forward, although the project schedule has shifted to accommodate other capital projects.

Table 2-65
Transmission – Lafayette-Clarks Corner 4-46 Str 39
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.1	2.1	0.0	0.0	0.0	-	3.2
2024	-	0.5	3.1	8.5	0.4	0.0	12.5

Leeds - SVC Protection & Control Replacement (C091040 - $2.9M)

The control system for the Leeds Station Static Var Compensator ("SVC") is obsolete and has limited spare parts and OEM Support. The control system has experienced two recent issues where the SVC was not available for service until repairs could be made.

Drivers:
The replacement of a control system in poor condition with limited spares and OEM support.

Customer Benefits:
The project replaces assets in poor condition and will help maintain system reliability.

2023 to 2024 Variance:
This project is progressing forward as planned.

Table 2-66
Transmission – Leeds - SVC Protection & Control Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.1	2.0	0.2	0.0	-	2.3
2024	-	1.2	1.7	0.0	0.0	0.0	2.9

Colony - Asset Replacement (C091871 - $1.4M)

The two 34.5kV OCBs General Electric Type FKA were installed in 1965, have indications of leaks, limited-to-no spare parts and limited-to-no OEM support.

The associated protection and control equipment are electromechanical relays which have limited spare parts and OEM support.

Drivers:
The proactive replacement of deteriorated assets instead of reactive replacement during a failure that could result in a long-time outage.

Customer Benefits:
The planned replacement of this substation equipment reduces the likelihood of an in-service failure which could lead to long-term interruptions of the system as well as customer outages.

2023 to 2024 Variance:
The project timeline was adjusted based upon project review and feasibility of construction.

Table 2-67
Transmission – Colony - Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY2FY28	FY29	Total
2023	0.0	0.0	0.0	2.7	1.0	-	3.7
2024	-	0.0	0.0	0.0	0.4	1.0	1.4

GCB to VCB Projects (C091903 - $18.0M)

The Gas Circuit Breaker ("GCB") to Vacuum Circuit Breaker ("VCB") program will allow for specific projects to be created to replace leaking SF6 GCBs that are not practical or economical to repair, with new vacuum circuit breaker interruption technology at 115kV level. The new VCBs will be targeting high leaking GCBs to be replaced and are more environmentally friendly than SF6 gas breakers. This initiative will support New York State goals to reduce greenhouse gas (GHG) emissions.

Drivers:
The replacement of leaking SF6 GCBs with environmentally friendly VCBs will help support the New York State GHG emission limits and net zero goals which are expected to be regulated by the NYS Department of Environmental Conservation ("NYS DEC") starting in CY2024.

Customer Benefits:
The replacement of leaking GCBs will maintain the reliability of the system.
2023 to 2024 Variance:
This project is proceeding as planned, although the material cost has increased.

Table 2-68
Transmission – GCB to VCB Projects
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.5	0.5	3.0	4.0	4.0	-	12.0
2024	-	0.5	2.5	5.0	5.0	5.0	18.0

NY Inspection and Refurbishment Programs

Transmission Footer Inspection & Refurbishment Program (C094239, C094240, C094241 - $12.2M)

The Company performs a 20-year cycle program of transmission steel tower footer inspections and refurbishment. This program systematically inspects foundations above and below grade, repairs damage and coats tower legs to extend the useful life of the asset.

In FY24, this program was split into three divisional funding project numbers (East, Central, and West) to allow for easier tracking of program.

Drivers:
This program identifies capital work through the footer inspection program.

Customer Benefits:
Reduces future CapEx spend required for structure replacements by extending their useful life.

2023 to 2024 Variance:
This program was not in the 2023 plan.

Table 2-69
Transmission – Footer Inspection & Refurbishment Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	2.9	3.0	3.1	3.2	12.2

Transmission Wood Pole Inspection & Treatment Program ("PIT") (C094237, C094244, C094245 - $3.5M)

The Company inspects and treats the ground line and below grade on all wood poles and structures on approximately a 10-year cycle. The wood pole inspection and treatment ("PIT") program installs/adds a preservative coating to the wood pole to enhance the structure durability. This treatment limits corrosion or rot and extends the useful life of the pole.

In FY24, this job was split into three divisional funding project numbers (East, Central, and West) to allow for easier tracking of program.

Drivers:
This program identifies capital work through the PIT inspection and treatment program.

Customer Benefits:
Reduces future CapEx spend required for structure replacements by extending the wood poles and structure's useful life.

2023 to 2024 Variance:
This program was not in the 2023 plan.

Table 2-70
Transmission – Wood Pole Inspection & Treatment (PIT) Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.8	0.9	0.9	0.9	3.5

Transmission Steel Tower Coating Program (C094238, C094242, C094243 - $22.0)

The Company's steel tower coating program applies protective/cathodic protection on structures. The coating provides neutralization and transforms eventual remaining rust as an inhibitor and provides active long-term protection from degradation and abrasion. Therefore, the life expectancy of the rehabilitated structure is essentially reset to the original expected design life when the structure was erected. This program enables the structure to remain in service for many more years than originally estimated. A steel tower coating program guides our approach toward the coating of steel structures to extend the service life of towers rated visual category 4 or better. The Company is working toward coating all 345kV and 230kV steel structures on an as-needed basis. For 115kV circuits, coating priority is determined by applying visual rating codes.

In FY24, this program was split into three divisional funding project numbers (East, Central, and West) to allow for easier tracking of program.

Drivers:
Tower coating provides long term, life extension without maintenance with an expectation of a minimum of 25-50 years, therefore, increasing the asset's useful life over that which was originally estimated. This program improves the quality and reduces the costs associated with operating the asset.

Customer Benefits:
Reduces future CapEx spend required for structure replacements by extending the structures useful life.

2023 to 2024 Variance:
This program was not in the 2023 plan.

Table 2-71
Transmission – Steel Tower Coating Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	5.1	5.4	5.6	5.9	22.0

2. E. Multi-Value Transmission (MVT)

MVT Asset Condition

Multi-Value Transmission - Asset Condition ("MVT AC") projects address asset condition issues while also addressing load growth. MVT AC projects encompass proactively replacing assets

identified to be in poor condition with higher rated equipment and associated asset replacements or installations as needed to support the system capacity increases.

Drivers:
The investments in this strategy are driven by the need to address the Company's deteriorating infrastructure, risk mitigation and obsolescence of assets and the ever-increasing customer electrification and decarbonization demands to maintain reliable network operation.

Customer Benefits:
The MVT AC projects maximize the utilization of existing asset condition projects and planned system capacity needs while avoiding the cost of constructing limited capacity infrastructure or otherwise inefficient solutions that only address a single asset condition issue.

Reynolds Road Station – Asset Replacement (C077616 - $10.2M)

The Reynolds Road Station is a 345kV, 115kV, and 13.2kV substation. All voltage levels are straight bus design with the 345kV, 115kV, and half the 13.2kV yards being open air. Additional 13.2kV circuits were added in 2010 utilizing metal-clad switchgear. There are two 345kV transmission lines, six 115kV transmission lines and eight 13.2kV distribution lines at the substation.

The 115kV assets that are targeted for replacement are six oil circuit breakers ("OCB") R84, R83, R2, R16, R52 and R9, 12 disconnect switches, and six voltage transformers ("VT") bus 99 and 77.

The 15kV assets that are targeted for replacement are four vacuum circuit breakers (VCB) R510, R520, R530 and R540, and two 115/13.2kV transformers.

Drivers:
The replacement of deteriorated assets and the support of local distribution planning by increasing capacity.

Customer Benefits:
The project replaces assets in poor condition and will help maintain system reliability.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-72
Transmission – Reynolds Road – Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	-	0.0	0.1	0.9	1.2	8.0	10.2

Tilden Station - Asset Replacement (C081785 - $14.7M)

Tilden Station is a 115kV and 34.5kV substation. Majority of the assets are original and some assets were replaced due to condition or failures. There are two 115/34.5kV transformers that

connect the 115kV to the 34.5kV system. The 115kV bus is presently designed as a single straight bus, while the 34.5kV bus is presently designed as two straight busses.

The original assets in the substation are in deteriorated condition, have limited spare parts and limited-to-no Original Equipment Manufacturer (OEM) support. In addition, the original oil filled assets have had a history of leaks.

The 115kV assets that are targeted for replacement are two 115/34.5kV transformers, three 115kV OCBs, and six 115kV VTs.

The 34.5kV assets that are targeted for replacement are six 34.5kV OCBs, two 34.5kV Station Service Voltage Transformers (SSVT), six 34.5kV VTs, and six 34.5kV bus arresters.

Drivers:
The assets are in poor condition. The OCBs lack spare parts and necessary maintenance support.

Customer Benefits:
The project replaces assets in poor condition and will help maintain system reliability.

2023 to 2024 Variance:
The project is progressing forward and was shifted due to project reviews.

Table 2-73
Transmission – Tilden: Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	0.6	0.7	5.3	4.8	-	11.5
2024	-	0.3	0.5	4.2	5.4	4.2	14.7

Spier Falls - Asset Replacement and Separation (C081788 - $13.6M)

The Spier Falls Station project is to replace the 115kV protection and control equipment which consist of electro-mechanical relays that are deteriorated, with limited spare parts and limited OEM support. The relays and controls are currently located in the Brookfield owned Powerhouse.

This project will construct a new control house in the substation yard including new protection and control equipment to replace the existing deteriorated equipment and provide for asset separation from Brookfield Power.

Drivers:
The assets are in poor condition. The protection assets are not located within a National Grid owned facility.

Customer Benefits:
The project replaces assets in poor condition and will maintain system reliability.

2023 to 2024 Variance:
Project is progressing as planned.

Table 2-74
Transmission – Spier Falls: Asset Replacement and Separation
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.1	0.1	1.0	7.4	-	8.6
2024	-	0.1	0.1	1.0	7.4	5.0	13.6

Teall Avenue Station – Asset Replacement (C086893 - $3.2M)

The Teall Avenue Station project is to replace deteriorated assets that have limited or no spare parts, limited or no OEM support, the oil containing assets have leaks and will support increased system capacity on the distribution system.

The assets being replaced are the 34.5kV OCBs, one 115/13.2kV transformer, and one 15kV metal-clad switchgear. The associated protection and controls for these assets is also planned for replacement due to obsolescence. In addition, distribution area planning requirements calls for the installation of a new 115/13.2kV transformer and 15kV feeders to enhance local system capacity and load relief.

Drivers:
The replacement of deteriorated assets with limited or no spare parts and limited or no OEM support.

Customer Benefits:
The proactive replacement of deteriorated assets to maintain system reliability, which if not completed would lead to continued deterioration and could lead to an unexpected failure. The support of local area planning needs to enhance system reliability.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-75
Transmission – Teall Ave – Asset Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.1	1.3	1.8	3.2

Geres Lock Station – Control House Replacement (C090822 - $4.3M)

The Geres Lock Station project is to replace the deteriorated protection and control assets contained within the control house (“CH”). The work to replace the assets and minimize outages would be to install a new control house and then complete the cutover from the existing protection and controls to the new protection and controls.

Drivers:
The replacement of deteriorated assets with limited-to-no spare parts and limited-to-no OEM support.

Customer Benefits:
The replacement of deteriorated assets with limited-to-no spare parts and limited-to-no OEM support.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-76
Transmission – Geres Lock – CH Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.0	0.3	4.0	4.3

Ballston Rebuild Substation (C093946 - $2.0M)

The Ballston Rebuild Substation project calls to upgrade the existing 115/13.2kV, 22.4 MVA distribution power transformer to 40 MVA.

Drivers:
Transformer TRF 3 is currently projected to be over 125% of its summer normal rating by 2029.

Customer Benefits:
This project, in conjunction with its distribution line component (C093744), will enable more capacity within the surrounding Ballston Spa area to address the anticipated load increases due to the electrification of transportation and heat.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-77
Transmission – Ballston Rebuild Substation
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.1	1.4	0.5	2.0

Schuyler Station (C093968 - $2.1M)

This project will add a second 40 MVA transformer to the Schuyler Station.

Drivers:
The additional transformer is driven by deteriorating infrastructure, risk mitigation, obsolescence of substation assets and system capacity violations based on forecasted load growth.

Customer Benefits:
The addition of the transformer addresses asset condition and load growth needs.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-78
Transmission – Schuyler Sub
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.1	1.5	0.5	2.1

MVT – CLCPA 2030 Dependent in Rate Case

Mortimer-Golah 110 Asset Condition Refurbishment (ACR) Rebuild (C060220 - $45.8M)

This project will completely rebuild the under ten-mile 115kV Mortimer-Golah 110 line with new structures and new conductor in the existing corridor. The existing structures and conductor will be removed.

Drivers:
This project relieves capacity constraints in the Genesee area and addresses asset deterioration on the existing circuit.

Customer Benefits:
This project increases capacity and maintains reliability in the Genesee area as well as supporting the State's Clean Energy Goals.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-79
Transmission – Mortimer - Golah #110 ACR Rebuild
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	-	7.4	8.0	16.5	13.7	0.2	45.8

Gloversville – Marshville 6 Line Refurbishment (C081458 - $33.0M)

This project rebuilds approximately eight miles of 69kV transmission line to 115kV standards. The work will be bundled with the rebuild of the 115kV Inghams-Meco 15 line: Clinton Tap which runs through the same transmission right of way ("ROW") to take advantage of bundling cost savings.

Drivers:
This project addresses deteriorated assets along the circuit.

Customer Benefits:
This project addresses asset condition issues with the existing transmission line and supports the State's clean energy goals through a capacity upgrade. This project also takes advantage of the cost savings associated with bundling.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-80
Transmission – Gloversville – Marshville #6 Refurb
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	-	0.0	0.0	0.8	13.2	19.0	33.0

Mortimer-Golah 109 - 69kV Rebuild (C081474 - $52.3M)

This project will completely rebuild the under ten-mile 69kV Mortimer-Golah 109 transmission line to operate at 115kV with new structures and new conductor in the existing 115kV Mortimer-Golah 110 corridor. The existing 69kV structures and conductor will be removed.

Drivers:
This project relieves capacity constraints in the Genesee area and addresses asset deterioration on the existing circuit.

Customer Benefits:
This project maintains reliability in the Genesee area and supports the State's clean energy goals.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-81
Transmission – Mortimer-Golah 109-69kV Rebuild
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	-	7.3	7.9	35.5	1.6	0.0	52.3

Coffeen Station – Asset Replacements (C081787, C087772, C089326, C092843 - $60.8M)

Coffeen Street Station is a 115kV, 23kV and 13.2kV substation. The 115kV bus presently is designed as a straight bus without a tie-circuit breaker which raises operational concerns.

The assets located at the substation are in deteriorated condition, have limited spare parts and limited-to-no OEM support. In addition, the original, oil-filled assets have a history of leaks.

Similarly, the 115kV, 23kV and 13.2kV relays and controls in the control house are obsolete, have limited spare parts and limited-to-no OEM support.
The Coffeen Station project is planned to replace deteriorated assets at the 115kV, 23kV and 13.2kV voltage levels, including: OCBs, VCBs, disconnect switches, insulators, potential transformers, two 115/23kV transformers, and two 115/13.2kV transformers. A new control house will also be installed.

The replacement for the 115kV yard will be planned to be a breaker and a half ("BAAH") layout in support of planning capacity and New York CLCPA initiatives.

Drivers:
The replacement of the assets and the installation of a BAAH substation to support clean energy goals.

Customer Benefits:
The project replaces assets in poor condition to maintain the reliability of the system.

2023 to 2024 Variance:
The project was to replace deteriorated assets, but during the clean energy reviews was expanded to support New York CLCPA goals through improved system capacity.

Table 2-82
Transmission – Coffeen: Asset Replacements
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	0.2	0.2	2.6	6.6	-	9.7
2024	-	6.5	23.9	25.9	4.5	0.0	60.8

Lockport Station (C035464, C073991 and C085990 - $76.9M)

Lockport Station is a 115kV switching substation with 13 115kV transmission lines serving the 115kV system in Western New York. The overall condition of the substation yard and control room is poor. Refurbishment work is required on control cable duct banks, breaker operators, structure painting and concrete equipment foundations that are significantly deteriorated.

The control room building is also in poor condition and requires significant repairs. It is an oversized building with continued maintenance costs for the original roof and the intricate brickwork. It contains a 90-ton overhead crane in the 25-cycle frequency changer portion of the building which is presently used only to store material. The control house roof was repaired in the 1990s and brick pointing was also done to limit deterioration within the last five years.

The Lockport Station project is to replace all the deteriorated assets at the 115kV and 12kV voltage levels which includes OCBs, disconnect switches, potential transformers, insulators and the 115/12kV transformer. The project will also include a new control house installation to include IEC 61850 technology. The new substation will be constructed as a greenfield and be a breaker and a half configuration.

Inghams Station Rebuild project - Presently named Manheim Greenfield (C050917, C060240 and C074000 - $69.7M)

Inghams Station is in the town of Oppenheim, New York and is a connection between a hydro generating station and the transmission and distribution electric system. The transmission voltage at Inghams is 115kV, with sub-transmission at 46kV, and distribution at 13.2kV. The Inghams station controls flows on the 115kV system with a phase angle regulator (“PAR”) type transformer that was installed in 1979.

The Inghams Station was flooded in 2006 and remains a flood concern. After the substation was repaired, a new stone wall approximately five feet tall was constructed along the substation perimeter that is shared with the river boundary. The stone wall is considered a temporary

measure as it will limit the current flow of the river if the river rises to flood heights again but will not necessarily prevent the substation from being flooded.

The Inghams Station project is to construct a new greenfield substation which will be above the 500-year flood zone, with the same straight bus configuration and existing layout. A new PAR with a wider range will be procured and the existing unit kept as a spare. A new control house will be installed at the new location.

The new location for the substation is in the town of Manheim which is approximately a quarter mile to the west of the existing Inghams Station.

Lighthouse Hill Station (C031662, C073996 and C073997 - $56.3M)

The Lighthouse Hill Station is a switching substation with two 115kV busses and seven transmission lines connecting to the station that allow power to flow from generation located along Lake Ontario to the Watertown area and Clay Station in the Syracuse area.

The substation has seven OCBs located 200 feet from the Salmon River, which is located 70 feet below the yard elevation. The station is also located approximately one mile upstream of the New York State Wildlife Fish Hatchery. Although the risk is low, any significant oil spill in the station could have a detrimental environmental impact.

Another significant issue at Lighthouse Hill is that the land is owned by Brookfield Power and operated as a shared facility under a contractual agreement. The lack of direct access to Brookfield's control room at Lighthouse Hill limits the Company's control over the housing conditions for the battery and relay systems. The Company has controls on the first floor of the control house, which is immediately adjacent and downstream of Brookfield's hydroelectric dam. An uncontrolled release from the dam could flood the control room area.

The plan is to build a new substation at a location approximately 1.5 miles west on land already owned-in-fee by the Company. This would reduce the likelihood and risk of oil contamination of the Salmon River. The new substation will include a 115kV breaker and a half bay configuration, one 115/34.5kV transformer, one 115/12kV transformer, and a control house.

Boonville Station (C049903, C082487, C082488 - $84.7M)

The Boonville Station was constructed in the 1950s and originally designed as a switching substation for several 115kV transmission lines and as the single source of the radial 46kV line to Alder Creek, White Lake, Old Forge, Eagle Bay and Raquette Lake. The use has not changed except for the addition of a 23kV terminal for hydro generation.

The structural steel and foundations are deteriorated. Over the years, the substation has sunk to an elevation lower than the adjoining highway and farm fields resulting in a lack of drainage. This drainage issue is also present in the underground manhole and conduit system. The water surface level at the substation causes the underground control cables to continuously be under water leading to their deterioration.

The substation was designed electrically with minimal redundancy and has antiquated relaying protection. The design has the single source transformer for the 46kV line to the Old Forge area connected off the south 115kV bus with no alternate method to supply the transformer if the south

bus is out of service. The 115/46kV transformer was replaced in the 1990s but is still the only source and cannot be maintained properly due to outage restrictions.

All electrical components at the station such as oil breakers, oil-filled potential transformers and switches require replacement. The station control building is brick and needs reconditioning. The size of the building has also become an issue with the addition of Energy Management System ("EMS") and relay upgrades over time.

The Boonville Station project will relocate the substation to a greenfield site and the 115kV yard will be constructed as breaker and a half to accommodate planning capacity in support of the New York CLCPA initiatives. The substation will include a new control house and be located near the existing substation.

Oneida Station (C034443, C084674, C087290 - $24.0M)

Oneida Station is a 115kV and 13.8kV substation located in Verona, New York that was originally constructed in the 1940s. The substation includes two load tap changer ("LTC") transformers, nine 115kV circuit breakers, one 115kV capacitor bank with circuit switcher, a metal-clad switchgear with eight 13.8kV feeders, and two 13.8kV capacitor banks.

The physical and electrical layout of the 115kV substation yard makes it difficult to maintain or repair equipment. Outages to maintain the 115kV breakers are difficult because a line outage is required. The two 1959 circuit breakers manufactured by Federal Pacific are candidates for replacement due to maintenance issues and a lack of replacement parts. The 115kV lines to Rome and Yahnundasis are difficult to de-energize when maintenance is required due to voltage support issues and taking the line associated with the R40 breaker out requires a customer outage. The vertical phase configuration of the East/West 115kV busses is a concern from a maintenance standpoint as the configuration makes tasks such as disconnect repair or replacement difficult due to difficulty in maintaining safe working clearances.

One of the 115kV circuit breakers is a 1961 vintage Westinghouse GM-6B. This breaker model has a complex arcing chamber and has on multiple occasions seen high resistance forming in the contacts. These breakers are being replaced on a system wide basis.

The Oneida Substation project is to replace deteriorated assets at the 115kV voltage level, which includes OCBs, disconnect switches, insulators, and potential transformers. The station will be a staged construction project that will install a 115kV breaker and a half layout with a new control house. There will be a second 115kV capacitor bank installed as part of the project to support voltage in the area.

2023 to 2024 Variance:
The substation rebuilds are continuously progressing forward although being modified to manage short term capital spending and handle the layout of the proposed substation rebuilds. There are some circumstances with land availability and the newly proposed electrical configuration that may affect the timeframe and cost and to support New York State Clean Energy Goals pertaining to CLCPA.

Table 2-83
Transmission – MVT CLCPA 2030 Dependent - In Rate Case
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	20.5	52.6	62.1	65.1	60.2	-	260.5
2024	-	48.9	79.1	81.4	62.4	39.8	311.6

MVT – Substation Rebuilds

Multi-Value Transmission ("MVT") Substation Rebuilds projects address asset condition issues while addressing load growth. MVT - Substation Rebuild projects encompass proactively replacing substation assets identified to be in poor condition with higher rated equipment and associated asset replacements or installations as needed to support the system capacity increases.

Drivers:
The investments in this strategy are driven by the need to address the Company's deteriorating infrastructure, risk mitigation and obsolescence of substation assets, and the ever-increasing customer electrification and decarbonization to maintain reliable network operation.

Customer Benefits:
The MVT - Substation Rebuild projects maximize the utilization of existing asset condition projects, equipment obsolescence, and planned system capacity needs while avoiding the cost of constructing limited capacity infrastructure or otherwise inefficient solutions that only address a single asset condition issue.

Greenbush Station (C079224, C091535 & C092621 - $39.1M)

The Greenbush Station contains 115kV, 34.5kV and 13.2kV voltage levels. The substation was originally constructed in the mid-1960s. This project will replace deteriorated assets at the 115kV, 34.5kV and 13.2kV voltage levels which includes OCBs, VCBs, disconnect switches, insulators and potential transformers, and install a new control house.

The replacement of the OCBs is part of an overall replacement strategy due to poor condition, obsolete parts and lack of original equipment manufacturer support. Similarly, the GCBs have had leaks and have limited spare parts. There have been two 34.5kV GCBs that have recently been replaced for VCBs and they are in good condition.

Homer Hill Station (C075942 - $11.9M)

The Homer Hill Station has 115kV and 34.5kV voltage levels and has 115kV asset concerns. The 115kV assets were installed in 1950, and many are original to the substation. The OCBs, oil filled potential transformers, insulators and disconnect switches are planned for replacement. The oil filled equipment has leaks and limited spare parts.

The 115/34.5kV, 7.5/9.375 MVA transformers were also installed in 1950 and are original to the substation. The automatic voltage regulating equipment for the LTC was replaced, but the remaining LTC and operating mechanism are original parts, with no spare parts available and limited OEM support.

The insulators are original to the substation, and some have already been replaced due to damage failure circumstances. The remaining insulators should be replaced because, based on industry experience, the cement around the core starts to deteriorate after being in service for 30 years. The disconnect switches that need to be replaced are those with the cap and pin insulators.

There are two control houses on-site. The 115kV control house is intermixed with microprocessors and electromechanical relays. The electromechanical relays have limited spare parts and OEM support.

Oswego Station (C076218 - $1.9M)

Three substation yards are located on the generation site owned by NRG which include a large 345kV switchyard, a 115kV switchyard and a 34.5kV switchyard originally designed and integrated when the generating station and substations were owned by Niagara Mohawk.

The Oswego Station project is to replace the 345kV control house which has electro-mechanical relays that are deteriorated, have limited spare parts and limited OEM support. The new Control House is to be constructed on-site and includes digital protection packages, with IEC61850 technology, for the existing assets.

Terminal Station Relocation (C076242, C080493 and C086695 - $23.1M)

Terminal Station was constructed in 1962 and is a 115/13.2kV two transformer distribution substation with seven distribution feeders and four network feeders. Westinghouse metal-clad switchgears are arranged in a breaker and a half scheme. The substation is supplied from the 115kV Porter 6 transmission line and the 115kV Schuyler 7 transmission line. The substation is located within a 100-year flood plain and it is also located in a major manufactured gas plant ("MGP") environmental clean-up site. The soil under the substation is assumed to be contaminated.

An asset condition report completed in 2013 identified multiple issues with the substation electrical equipment and recommended replacement of 115kV OCBs R60 and R70 and all 115kV manually operated disconnect switches and motor-operated disconnect switches. All of the substation's 15kV circuit breakers are roll-in Westinghouse type 15-DH-750E circuit breakers that have been targeted for replacement. Replacement of transformer TRF 2 was also recommended due to oil leakage and signs of possible coking. The sister unit failed in 2008 due to a shorted winding.

The recommended plan consists of a complete rebuild of the substation at a new location south of the existing station on land owned by National Grid that is above the 100-year flood plain. The new substation will utilize an open air 115kV breaker and a half configuration and a 115kV ring bus. This plan reduces the scope and associated cost of the distribution feeder work by eliminating a significant portion of the underground feeder duct-bank while also limiting distribution infrastructure within the contaminated site.

Ash St. Station 34.5kV Rebuild (C088028 - $0.9M)

The Ash Street Station has a 34.5kV straight bus design where the OCBs and associated assets are in deteriorated condition.

The 34.5kV assets were installed in 1963, and many are original to the substation. The OCBs, oil filled potential transformers, insulators, surge arrestors and disconnect switches are assets planned for replacement. The oil filled equipment has indicated leaks and limited spare parts.

Multiple OCB, 34.5kV bus PT foundations, and multiple underground ("UG") cable getaway structure foundations are showing signs of significant undermining and/or heaving.

UG 34.5kV cables associated with feeds to transformers TRF 7, TRF 8, and TRF 9 will be replaced as the compound filled potheads are showing signs of weeping and leaking compound. Chipped water sheds were also noted on the cable pothead off R295 that feeds transformer TRF 9.

The protection and control equipment, electromechanical relays which have limited spare parts and OEM support. The OCB protection and control equipment are in a common control house which currently has little to no free panel space.

North Troy Station 34.5kV Asset Replacement (C079223 - $9.9M)

The remaining five 34.5kV OCBs were installed in 1982 and are a combination of General Electric and McGraw Edison breakers. The oil filled equipment has indications of leaks and limited spare parts. Three have already been replaced with the most recent being in 2007.

The replacement of a 115kV – 34.5kV transformer due to deteriorating over its lifetime, having limited spare parts, limited OEM support and being increased in MVA to support local area planning capacity.

The replacement of a 115kV – 13.2kV transformer to support local area planning capacity.

The associated protection and control equipment are electro-mechanical relays which has limited spare parts and OEM support.

Rotterdam Asset Replacement (C034850 - $1.9M)

This project is to replace deteriorating assets with limited-to-no spare parts and limited to no OEM support. There are five 230kV OCBs, one 230/115kV transformer, and three 115kV VTs.

2023 to 2024 Variance:
The substation rebuilds are continuously progressing forward although being modified to manage short term capital spending and address the layout of the proposed substation rebuilds. There are some circumstances with land availability that may affect the timeframe and to support New York State clean energy goals pertaining to CLCPA.

Table 2-84
Transmission – MVT Substation Rebuilds
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	20.5	52.6	62.1	65.1	60.2	-	260.5
2024	-	12.4	12.3	8.2	15.8	40.0	88.7

MVT – Overhead Line Refurbishment

Multi-Value Transmission ("MVT") Overhead Line Refurbishment projects address asset condition issues while addressing load growth. MVT – Overhead Line Refurbishment projects encompass proactively replacing overhead line assets identified to be in poor condition with higher rated equipment and associated asset replacements or installations as needed to support the system capacity increases.

Drivers:
The investments in this strategy are driven by the need to address the Company's deteriorating infrastructure, risk mitigation, and the ever-increasing customer electrification and decarbonization needs to maintain network operation.

Customer Benefits:
The MVT – Overhead Line Refurbishment projects maximize the utilization of existing asset condition projects and planned system capacity needs while avoiding the cost of constructing limited capacity infrastructure or otherwise inefficient solutions which only address a single asset condition issue.

The more significant overhead line refurbishment projects in this Plan are listed below. Additional details are included in Exhibit 5 – Overhead Line Refurbishment Projects.

Gardenville-Dunkirk 141-142 N Phase Rebuild (C003389 - $35.0M)
Gardenville-Dunkirk 141-142 T1260-70 ACR Seneca Nation (C034193 - $8.4M)
Gardenville-Dunkirk 141-142 T1260-70 ACR (C081744 - $27.6M)
Gardenville-Dunkirk 141-142 S Phase Land (C081750 - $1.5M)
Huntley-Gardenville 38/39 Rebuild (C075543 - $7.4M)
Lockport-Batavia 107 Rebuild (C086920 - $60.5M)
Lockport-Batavia 108 Rebuild (C086921 - $60.6M)
Lockport-Batavia 112 T1510 ACR (C003422 - $75.7M)
Access Rd – Lockport Batavia 112 (C089590 - $5.0M)
Moons-Falconer 175/176 Rebuild (C083216 - $23.8M)
SE Batavia-Golah 119 ACR (C060217 - $1.1M)
Teall-Carr 6 Rebuild (C091985 - $11.0M)

2023-2024 Variance:
The Asset Condition Refurbishment ("ACR") projects were originally initiated to address asset condition issues, reliability & safety concerns. ACR projects were evaluated for potential load and generation growth and, if warranted, identified as an MVT-AC project. The additional capacity scope increased the cost of the ACR projects.

Table 2-85
Transmission – MVT Overhead Line Refurbishment
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	35.7	45.1	59.7	53.3	64.3	-	258.1
2024	-	37.1	39.2	31.3	62.1	147.6	317.4

MVT - Transformer Replacement Program

Multi-Value Transmission ("MVT") Substation Transformer replacement projects address asset condition issues while addressing load growth. MVT – Transformer replacement projects encompass proactively replacing substation transformer assets identified to be in poor condition with higher rated equipment and associated asset replacements or installations as needed to support the system capacity increases.

Drivers:
The investments in this strategy are driven by the need to address the Company's deteriorating infrastructure, risk mitigation and obsolescence of substation assets, and the ever-increasing customer electrification and decarbonization needs to maintain network operation.

Customer Benefits:
The MVT – Transformer replacement projects maximize the utilization of existing asset condition projects, equipment obsolescence, and planned system capacity needs while avoiding the cost of constructing limited capacity infrastructure or otherwise inefficient solutions which only address a single asset condition issue.

Mohican Station (C053133 & C080755 - $18.0M)

The two 115/34.5kV transformers at Mohican have indications of hotspots, gassing from arcing under oil, and high moisture-in-oil levels from maintenance reviews of the transformers. The transformers were placed on the watch list in New York. In addition, the recent Moreau Area Study recommended the installation of a 40 MVA, 115/13.2 kV distribution transformer with four new 13.2 kV feeders to allow for the retirement of the Farnan Road, Henry Street, Hudson Falls and McRea Street distribution substations.

Seneca Station TRF 5 (C069427 - $1.3M)

There is a history of failure of this particular transformer design. The transformer TRF 4 at Seneca Station failed in 2014, followed by transformer TRF 3 in 2015. The transformer TRF 2 has been replaced following a failure in 2018. Similarly, transformer TRF 5 is being replaced due to asset condition and to maintain the future reliability of the 23kV system in the City of Buffalo.

Elm Street Station TR 2 (C069426 - $1.9M)

The transformer TRF 4 at Elm Street Station failed in 2013. Similarly, transformers TRF 1 and TRF 2 were identified by testing as being at-risk of damage/failure. Transformer TRF 2 is the last of that vintage at the substation and has been replaced, while the protection and controls are progressing forwards for replacement for all the transformers.

Woodlawn Station (C051986 - $7.9M)

The substation's transformer TRF 1 has had hotspots and arcing under oil in the past. The oil quality is below the acceptable threshold with inter-facial tension and moisture and dielectric strength being outside expected in-service values. In addition, the main tank oil is increasing in moisture at a slow rate. Electrical tests also show deterioration of the winding insulation. The tight physical clearances between the low voltage and high voltage structure make an emergency

replacement difficult. Transformer banks TB2 A, B and C all have partial discharge problems as indicated by increased hydrogen in the DGA results. All three have high moisture-in-oil levels, which can lead to low dielectric strength and contribute to chemical reactions that degrade the oil quality. The three single-phase transformer design makes emergency replacement with a three-phase unit challenging.

Hoosick Station (C053132 - $9.4M)

The transformer bank of 115/34.5kV transformers, TB 1 A, B and C at Hoosick Station have indications of hotspots, gassing from arcing under oil, and high moisture-in-oil levels from maintenance reviews of the transformers. The transformers were placed on the watch list in New York. These projects are part of CLCPA Ph1 in the Rate Case supporting Distribution projects.

2023 to 2024 Variance:
The variance is due to timing adjustments to accommodate other capital projects and where possible, to combine with substation rebuild projects.

Table 2-86
Transmission – MVT Transformer Replacement Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	12.4	23.3	5.1	0.4	0.0	-	41.2
2024	-	21.7	8.5	4.5	3.4	0.4	38.5

MVT Reliability

This program constructs reinforcements to the system to strengthen the transmission network, ensure adherence to reliability standards and provide for the unbottling of solar (photovoltaic) and land-based wind generation.

The major components of this program with investment levels greater than $1 million in any fiscal year include:

Rotterdam 69kV Rebuild & New TB (C082180 - $7.5M)
Scho/Sch Int-Rott 18/4 Rebuild (C082182 - $7.3M)
MVT Rotterdam 69kV Rebuild & New TB – CH (C092550 - $1.7M)

Drivers:
There are over 800MW of proposed solar projects in the NYISO Interconnection queue that applied to interconnect to National Grid's 115kV transmission and 69kV sub-transmission networks between the Inghams and Rotterdam substations in the Mohawk area. Over 100MW of distributed generation applied to interconnect to the distribution stations served by these transmission and sub-transmission networks as well. A National Grid Planning analysis modeled all of the proposed projects and identified local transmission and sub-transmission elements which have the potential to become overloaded under certain system conditions with this additional generation. Frequent curtailment by system operators would be required to prevent these overloads.

Customer Benefits:
Production cost modeling determined transmission and sub-transmission constraints would result in an estimated 136GWh of annual curtailment. Through increasing the capacity of the most binding transmission and sub-transmission elements with select equipment upgrades and reconductoring, up to 115GWh of renewable energy can be unbottled annually and future asset condition needs can be mitigated.

2023 to 2024 Variance:
The variance is due to adjusted scope and schedule as the project has progressed.

Table 2-87
Transmission – MVT Reliability Rotterdam
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.5	7.0	5.1	5.2	0.0	-	13.6
2024	-	10.3	6.1	0.0	0.0	0.0	16.4

West Sweden Station (C094417 - $7.7M)
West Sweden Station TLine (C094416 - $2.3M)

Drivers:
The Brockport 111, 113 Taps supply a large number of customers with a limited number of transmission supply circuits. This will also provide for automatic sectionalizing of the Lockport-Mortimer 111 & 113 lines that are over 140 miles of exposure.

Customer Benefits:
This project decreases the amount of exposure to outages due to auto sectionalizing of Lines 111 and 113 as well as tying Line 114 into the other two at the new substation.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-88
Transmission – MVT Reliability West Sweden
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.5	3.1	6.4	10.0

Malone Par (C084542 - $6.4M)

Drivers:
This program addresses congestion on the Colton-Browns Falls-Taylorville lines resulting from non-conductor equipment limits and the free-flow of power from the 230kV system to the 115kV system.

Customer Benefits:
The replacement of the limiting non-conductor equipment to increase circuit and the installation of a phase angle regulating transformer at Malone will increase the ability of the transmission system to deliver clean renewable energy.

2023 to 2024 Variance:
The project is progressing as planned.

Table 2-89
Transmission – MVT Reliability Malone Par
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	6.2	5.6	1.5	0.9	0.0	-	14.2
2024	-	0.0	0.0	0.5	3.1	6.4	10.0

MVT CLCPA – Phase 1

Multi-Valued Transmission ("MVT") CLCPA – Phase 1 projects are designed to address both National Grid system needs, and State transmission needs to integrate renewable generation and storage. These projects will advance the development of system upgrades and create additional system benefits by increasing transmission capability for renewable energy deliverability per PSC Case 20-E-0197.

Drivers:
The New York State mandate to get 70% of energy from renewable sources by 2030 and achieve a 100% emission free grid by 2040 will require not only a large number of new renewable generators and storage, but also investment in the transmission and distribution systems. National Grid studies have shown that the transmission system in many of the areas of highest renewable generator interest is not capable of delivering power from the generators to the loads, both local and statewide. These projects are designed to address transmission system limitations and correct the curtailment of renewable generation.

Customer Benefits:
These projects allow for additional renewable energy to reach the customers in support of the State's clean energy goals.

The following specific projects are classified as CLCPA Phase 1:

Marshville 115kV Rebuild (C088329 - $5.6M)

This project will replace the existing 115:69kV 40 MVA TRF 1 and 115:69kV 50MVA TRF 2 with two new 115/69kV 33/44/56 MVA Y:Y transformers. This will require the replacement of the existing motor operated disconnect switches 6199 and 6299 with new 115kV 1200A circuit switchers CS1 and CS2 on new support structures. The two existing 115kV line breakers will be replaced with new 115kV 2000A SF6 type breakers. The four 115kV Disconnect Switches SW1188, SW1199, SW1288, and SW1299 will be replaced with new 115kV 2000amp gang operated disconnect switches.

Inghams/Rotterdam Circuit Rebuild (C088402 - $319.1M)

This project will completely rebuild the 7.12-mile 115kV Inghams – St. Johnsville 6 (T5260) line, the 23.9-mile 115kV Inghams – Stoner 9 (T5270) line, the 15.9-mile 115kV Maple Ave – Rotterdam 10 (T7040) line, the 9.86-mile 115kV St. Johnsville – Marshville 11 (T5780) line, the 1.16-mile 115kV Clinton – Marshville 12 (T5100) line, the 23.1-mile 115kV Stoner – Rotterdam 12 (T5800) line, the 23.3-mile 115kV Inghams – Meco 15 (T5250) line, the 7.51-mile tap to Clinton

Substation, and the 15-mile 115kV Meco – Maple Ave 22 (T7030) line. The existing conductor will be replaced with two bundled 795 ACSR 26/7 “Drake” conductor, and the existing shield wire with one 3/8” steel and one OPGW.

Meco 115kV Rebuild (C088414 - $11.2M)

This project will replace the existing 115kV-69kV 40/53.3 MVA TR1 with a new 115kV-69kV 56 MVA with LTC transformer and install a new 115kV-69kV 56 MVA with LTC TR2. The existing R22 and R21 circuit breakers will be replaced with new 115kV 2000A circuit breakers. The existing four 115kV gang operated disconnect switches SW2288, SW2277, SW1588 and SW1577 will be replaced with 115kV 2000A gang operated disconnect switches. The existing 115kV MOD switch SW6177 will be replaced with a new 115kV 2000A circuit switcher. The new transformer bay will require the extension of the 115kV and 69kV buses. The new transformer bay will also have a new 115kV 2000A circuit switcher, 1200A 69kV circuit breaker and three 69kV gang operated disconnect switches. All new equipment will require new foundations and structures.

Saltsman Rd New 5 Breaker Ring (C091495 - $16.2M)

Build a new 115kV five breaker ring bus transmission station along the right-of-way for the Inghams-Meco-Clinton #15 and Inghams-Stoner#9 lines south of Saltsman Rd near where the line is tapped to feed the Clinton Station. The new station will be constructed in such a manner that the station will operate as a five-breaker ring bus but can easily be converted to a breaker and half station in the future. The new station is expected to connect a total of five 115kV lines; two 115kV line back to Inghams, one line to Meco, one line to Stoner and a tap to the Clinton Station.

Dunkirk to Laona 161/162 Rebuild (C088399 - $43.0M)

This project will rebuild 4.9 miles of the Dunkirk – Laona T1090 #161 and T1100 #162 lines from New Road Switching Station to Laona Substation. The existing conductor will be replaced with one 1590 ACSS conductor and existing shield wire will be replaced with one 3/8” steel and install one OPGW. This project will include the replacement of structures with steel H-Frame structures on the 230kV Gardenville-Dunkirk #73/#74 lines at the point of crossing.

North Leroy - 115kV Thermal Upgrade (C088428 - $0.02M) Phase 1 Local

This project is required to increase the thermal capability of the station equipment to correspond to the associated transmission line rating. This project will replace the existing motor operated disconnect switches SW28 and SW29 with new 2000A motor operated disconnects. The existing 397.5 ACSR conductors between the new disconnects and their respective line terminations will be replaced with new 1192 ACSR conductors (two per phase). This will require the modification of the existing 115kV structure to support the new disconnect switches and new insulators.

SE Batavia - Golah LN119 Rebuild (C088631 - $68.5M)

This project is for the full rebuild of 15.9 miles of the 115kV SE Batavia - Golah 119 line from Structure 107 to Golah Station. The existing conductor will be replaced with 1590 ACSS conductor and existing shield wire with one 3/8” steel and install one OPGW.

Mortimer 109 bay 115kV Upgrade (C088632 - $1.1M)

This project will rebuild the Line 109 bay at Mortimer from 69kV to 115kV. The 115:69kV 33.6/44.8/56 MVA LTC transformer, 69kV UG cable/duct, 69kV breaker R214 and associated relaying will be removed. Approximately 250ft of new three-phase 115kV 4-inch AL bus tubing with nine bus support structures and foundations will be installed as a low-profile bus from the 109-bay connection to disconnect switch 172 on the north bus. The existing 3000amp GCB R174 will be relocated to the 109 bay and reused for line protection.

Golah sub rebuild (C051831 - $18.7M)

This project is for the 115kV rebuild of Golah Station and upgrade of the Line 109 bay from 69kV to 115kV. This will require the replacement of Golah Station with a new breaker and a half substation in the vicinity of the existing substation, including new breakers, switches, grading, ground grid and fencing. The existing transformer TRF 3 will be removed and one new 69kV:34.5kV 30/40/50 MVA w/ TRF 1 installed. The mobile capacitor bank will be replaced with two new permanent 115kV 40 MVAR capacitor banks with two new 115kV SF6 2000A capacitor bank synchronous close circuit breaker. A new 24ft by 32ft control encloser will be installed. The existing obsolete electro-mechanical relays will be replaced with digital relaying for the line, transformer, and bus protection.

Fenner Wind Station - LN3,8 THERMAL UPG (C088424 - $0.1M)

This project is required to increase the thermal capability of the station equipment with the associated transmission line rating. This project will replace the existing 795 ACSR conductors with 1192 ACSR in the R30 and R80 breaker bays. The existing R30 and R80 CTs will be set to the 800:5A tap and the corresponding Line 3 and Line 8 relaying will need to be reset and recommissioned.

Nile Hill Switch Structure - 115kV THERMAL Upgrade (C089452 - $0.7M)

This project will replace switch structure 693 with a new switching structure and 2000-amp switch and replace approximately 900 circuit feet of the existing 336 ASCR conductor with 795 ACSR 26/7 “Drake” conductor between dead end Str 288 and Str 292.

Nile Station - 115kV THERMAL UPGRADE (C088427 - $0.02M)

This project is required to increase the thermal capability of the station equipment with the associated transmission line rating. This project will replace the upper and lower 115kV copper bus between SW660 and SW676 with new 795 ACSR conductors.

Tilden Station - LN18 THERM UPG (C088430 - $0.02M)

This project is required to increase the thermal capability of the station equipment with the associated transmission line rating. This project will replace the existing 500 Cu conductors with new 1192 ACSR in the R180 breaker bay. New insulators will be required to support the new conductors. The Line 18 system B electromechanical relays will be replaced with a new digital step distance relay and the R180 CT will be wired to the 1200:5A tap.

Rotterdam LN10 &LN 12 THERM UPG (C088429 - $0.2M)

This project replaces the 1 200 A rated group operated horizontally mounted disconnect switches SW1288 and SW1299 with 2 000A disconnect switches and replace the 1 200 A rated underhung mounted hook-stick operated disconnect switches SW1088 and SW1099 with group operated disconnect switches rated 2 000A. The existing conductors between the 115kV bus 99G and 77G to their respective take-off structures will be replaced with bundled 1192 ACSR conductors (two per phase).

Tilden-Cortland LN18 Clearance (C088415 - $3.3M)

This project is to uprate the thermal rating of the line by correcting all clearance issues that derate the line. This project will replace 14 wood H-Frame suspension structures with single circuit steel H-Frame structures and one wood three pole suspension structure with a steel three pole suspension structure. The existing 795 ACSR conductor and 3/8" EHS 7 shield wire will be transferred.

Drivers:
There are over 800MW of proposed solar projects in the NYISO Interconnection queue that applied to interconnect to National Grid's 115kV transmission and 69kV sub-transmission networks between the Inghams and Rotterdam substations in the Mohawk area. Over 100MW of distributed generation applied to interconnect to the distribution stations served by these transmission and sub-transmission networks as well. A National Grid Planning analysis modeled all of the proposed projects and identified local transmission and sub-transmission elements which have the potential to become overloaded under certain system conditions with this additional generation. Frequent curtailment by system operators would be required to prevent these overloads.

Customer Benefits:
Production cost modeling determined transmission and sub-transmission constraints would result in an estimated 136GWh of annual curtailment. Through increasing the capacity of the most binding transmission and sub-transmission elements with select equipment upgrades and reconductoring, up to 115GWh of renewable energy can be unbottled annually and future asset condition needs can be mitigated.

2023 to 2024 Variance:
The project scopes, estimates and schedules have been revised as engineering has progressed.

Table 2-90
Transmission – CLCPA Ph1
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	29.9	31.8	96.4	148.5	147.0	-	453.6
2024	-	41.6	126.4	188.3	106.1	62.9	525.3

Reliability capital expenditures are required to improve power quality and reliability performance.

Conductor Clearance Programs

Conductor Clearance NY Program (C048678 - $7.6M)
Conductor Clearance NYE Program (C093895 - $38.0M)
Conductor Clearance NYC Program (C093896 - $38.0M)
Conductor Clearance NYW Program (C093879 - $29.0M)

The Conductor Clearance Correction Programs (C048678, C093895, C093896, C093879) will increase the clearance of certain overhead conductors to meet clearance standards prescribed by the NESC under certain loading conditions. Three funding projects have been created for the three NMPC divisions (East, Central, and West). The three divisional funding projects have been created to ensure resourcing allocation and spending is dispersed appropriately across New York State. The need to correct clearances was identified as the result of an ongoing Aerial Laser Survey ("ALS"), also known as Light Detection and Ranging ("LiDAR"), being conducted on the transmission system. Aerial surveys provide a level of accuracy which was previously only available by ground inspection. The project will continue beyond FY24 to address conductor clearance issues for 115 kV lines. This timeline assumes there will be no further directives from FERC similar to the October 7, 2010, NERC Alert (Recommendation to Industry: Consideration of Actual Field Conditions in Determination of Facility Ratings) that would prescribe a specific correction period.

Drivers:
The primary driver for this work is public and employee overhead line safety per NESC recommendations. The NESC sets conductor clearances of overhead lines from the ground and other ground-based objects. This program addresses transmission lines that do not meet current NESC standards by improving ground-to-conductor clearances in substandard spans. This follows standard industry practice and the Public Service Commission's Safety Order (Case 04-M-0159).

Customer Benefits:
Application of the NESC criteria lowers the risk of safety events caused by substandard clearance conductors.

2023 and 2024 Variance:
There is an increased focus on this program reflected in the spending profile through the plan. Additional locations will be addressed compared to previous capital plans.

Table 2-91
Transmission – Conductor Clearance Programs
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	10.0	25.0	25.0	25.0	-	85.4
2024	-	7.6	24.9	30.8	18.1	31.0	112.3

Dunkirk-Falconer 160 Rebuild/CCR (C086816 - $13.2M)

This project will address asset condition-related issues, as well as conductor clearance issues, on the 115kV Dunkirk-Falconer 160 line. The wood 2-pole H-Frame structures are in poor condition due to decay and woodpecker damage. As part of development of this project, the entire circuit received an aerial comprehensive inspection to identify defects, conductor and shield wire were tested, and wood poles were inspected/treated. A conductor clearance analysis will also be included in the scope of work to resolve these issues. Of the 488 wood structures, early investigation suggests nearly 200 need replacement.

Drivers: A large number of places of interest were identified during a Conductor Clearance Check and comprehensive aerial inspections identified asset condition issues. The primary drivers of this project are line resiliency and safety. The conductor height does not meet NESC standards and severe woodpecker damage has been found on these structures.

Customer Benefits:
Replacing these structures will address the asset condition and conductor clearance issues. This will improve the lines' overall resiliency to adverse weather and increase the safety of the lines with up to standard conductor clearances.

2023 to 2024 Variance:
As a result of the I&M replacement project, the project has been shifted and the scope decreased due to overlap.

Table 2-92
Transmission – Dunkirk-Falconer #160 Rebuild/CCR
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.05	1.1	11.7	4.3	0.7	-	17.9
2024	-	0.0	0.05	0.2	13.0	0.0	13.2

RC-MOD Huntley - Lockport 36 & 37 (C085239 - $3.3M)

TCC The Transmission Control Center has identified eight locations on the 115kV Huntley–Lockport 36/37 lines for the installation of new Cleaveland/Price disconnect switches equipped with Remote Controlled, Motor Operators (RC-MODs).

Drivers:
The 115kV Huntley–Lockport 36/37 lines have seven substations which are tapped off the main line. In the present configuration of the circuits, there is very little flexibility for the TCC to isolate faults to restore service to customers. A fault on these circuits will leave some, if not all, of these substations without power.

Customer Benefits:
The primary benefit is improved reliability for our customers. By replacing older, non-functioning switches, the exposure of faults affecting customers is reduced and the supervisory control of the disconnect switches decreases the response time to isolate faults. Additionally, adding a RC-MOD provides the field switch supervisory control functionality. This gives the Transmission Control Center (TCC) the ability to operate a field switch remotely, which has the potential to isolate faults and bring back customers, quickly. Finally, by replacing the old switches, the safety experienced by the line crews who operate these switches will be improved.

2023 to 2024 Variance:
Project is progressing as planned. Due to the need for extra design time, engineering was pushed out to FY25, with construction occurring in FY26.

Table 2-93
Transmission – RC-MOD Huntley - Lockport 36 & 37
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	3.3	0.0	0.0	0.0	0.0	-	3.3
2024	-	0.03	3.3	0.0	0.0	-	3.3

RC-MOD Packard-Gardenville 181&182 (C085238 - $1.9M)

The Transmission Control Center has identified four locations on the115kV Packard–Gardenville 181/182 for the installation of new Cleaveland/Price disconnect switches equipped with Remote-Controlled, Motor Operators (RC MODs). All circuit designations are in terms of post the completion of project C079506 & C081799.

Drivers:
The 115kV Packard–Gardenville 181/182 lines are installed on double-circuit towers without disconnect switches. In the event of a tower failure, this would cause an interruption to the eleven substations that are supplied by these circuits. The substations that would be affected are Packard, Gardenville, Station 130, Erie County Water Authority Ball Pump Station, Youngmann Terminal Station, Frankhauser Station, Park Club Lane Station 219, Xylem Heat Transfer, Walden Sub (New York State Electric & Gas), and Long Road Station 209.

Customer Benefits:
The primary benefit is improved reliability for our customers. By replacing older, non-functioning switches, the exposure of faults affecting customers is reduced and the supervisory control of the disconnect switches decreases the response time to isolate faults. Additionally, adding a RC-MOD provides the field switch supervisory control functionality. This gives the Transmission Control Center (TCC) the ability to operate a field switch remotely, which has the potential to isolate faults and bring back customers, quickly. Finally, by replacing the old switches, the safety experienced by the line crews who operate these switches will be improved.

2023 to 2024 Variance:
This project is progressing as planned. Due to the need for extra design time, engineering was pushed out to FY25, with construction occurring in FY26.

Table 2-94
Transmission – RC-MOD Packard-Gardenville 181&182
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.6	0.0	0.0	0.0	0.0	-	1.6
2024	-	0.03	1.8	0.0	0.0	0.0	1.9

Smart Fault Indicator Program-NY (C082281 - $9.6M)

The program will install "smart" fault indicators on the 115kV transmission system. TCC identifies select circuits that will benefit from the installation of fault indicators based on historic reliability data and any current needs.

Drivers:
Smart fault indicators are a useful tool for utilities. Currently, National Grid uses fault indicators that do not communicate with any of our systems and must be viewed in the field to determine their reading. With the advancements of technology, access to fault information can be viewed remotely. This allows the Company to more accurately dispatch field personnel, expedite switching operations, decrease the length of patrol for field personnel and ultimately reduces restoration times.

Customer Benefits:
The main benefit of this program is reduced outage times. Crews are dispatched closer to the fault location, have less line to patrol, switching operations are streamlined. This has the additional benefit of reducing costs for patrols and inspections.

2023 to 2024 Variance:
The Company is re-evaluating the smart fault indicator program to consider updated technology equipment that can streamline the process from inception to installation, reduce complexity, and reduce cost per install. Installations are planned to be focused in FY26-FY29

Table 2-95
Transmission – Smart Fault Indicator Program-NY
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	3.0	3.0	3.0	3.0	-	12.0
2024	-	0.05	0.5	3.0	3.0	3.0	9.6

Gardenville-Dunkirk 73 & 74 SNI ACR (C091979 - $4.8M)

Drivers:
The driver of this work is to bundle asset condition work on the 230kV Gardenville-Dunkirk 73/74 lines located in the same corridor as the proposed 115kV Gardenville-Dunkirk 141/142 lines Southern section within the Seneca Nations of Indians territory. It is expected that matting will be required.

Customer Benefits:
The main benefit to customers is a bundled work project. Typically, access and matting is a major percentage of a capital project cost. By bundling the work this should eliminate the need for future access into the area. And replacement of wood structures with the current standard of steel should eliminate a major project in this area in the future.

2023 to 2024 Variance:
Cost adjustments have been made due to project bundling.

Table 2-96
Transmission – Gardenville-Dunkirk 73 & 74 SNI ACR
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.1	1.3	0.0	-	1.4
2024	-	0.0	0.1	0.2	0.5	4.0	4.8

State Campus-Menands #15 and #12 Underground Cable Replacement (C088133 - $7.1M)

The project replaces the approximately 2,600 circuit feet (1,300 circuit feet per line) of underground 115kV transmission near Central Ave / NY 5 in Albany.

Drivers:
Under certain system conditions and particularly high anticipated load growth in the area, system studies show the #15 cable to be overloaded as early as 2027, with overloading becoming worse in subsequent years. This circuit is part of the path between Rotterdam and Menands, and supplies two key substations in the Capital District. In addition, the terminations on both the #12 and the #15 circuit are among a population of 1990's era G&W terminations with a failure rate of 50% every 20 years. A program is in place to drive replacement of all of these terminations across the network. Once the new cables are pulled in, new terminations will be installed, and the risk will be mitigated. The #12 cable will also be replaced as it will also become overloaded as loading increases in future years. It must be taken out of service to have its faulty terminations replaced anyhow, and the cable length is very short, so the added cost to replace it is small relative to the overall project cost. It is therefore cost-efficient to perform its replacement while mobilized to replace the #15 cable.

Customer Benefits:
This will maintain reliability to customers in the area including State Government buildings, SUNY/CESTM Research Facility, and many thousands of residential & commercial customers supplied by several substations. It will also support the State's clean energy goals while preparing the system for fossil generation retirements.

2023 to 2024 Variance:
This project is progressing as planned.

Table 2-97
Transmission – State Campus-Menands #15 and #12 UG Replacement
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.1	0.7	3.5	3.5	-	7.8
2024	-	0.1	0.6	3.0	3.0	0.4	7.1

Breaker Projects (C090657, C090658, C090662 - $1.3M)
These three projects are to install new 23kV circuit breakers at Sawyer Terminal Station, to move Cable 36H to a new position, connect new cable 25H and connect Cable 9H in a new position.

Drivers:
These will provide for a better distribution of loads and customers amongst the cable groups originating at Sawyer Terminal Station.

Customer Benefits:
This redistribution will improve the resiliency of the system supplying the various distribution stations.

2023 to 2024 Variance:
These projects have been rephased.

Table 2-98
Transmission – Breaker Projects
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	1.3	0.3	0.0	0.0	-	1.7
2024	-	0.0	0.0	0.0	0.0	1.3	1.3

Packard-Huntley 77 78 Re-insulation (C093019 - $10.3M)

This project will reinsulate the 230kV Packard-Huntley 77/78 lines with toughened glass insulators, and the hardware will be replaced also.

Drivers:
Reliability and resiliency are the primary drivers of this project. An aerial inspection conducted on the 230kV Packard – Huntley 77/78 lines identified insulator and hardware deterioration on the line. Replacing the insulators and hardware will address the issues caused by deteriorating hardware and insulators.

Customer Benefits:
This project will address trips and faults caused by deteriorating insulators and will improve line reliability with new hardware. Failed insulators are associated with trips and faults and deteriorating hardware increases the probability of conductor down events.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-99
Transmission – Packard-Huntley 77 78 Re-insulation
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.2	3.4	6.7	0.0	0.0	10.3

Cicero Substation Transmission Line Taps (C093003 - $2.7M)

This project supports the transmission line taps that are needed from the 115kV Clay - Dewitt 3 line and Clay - Teall 10 line into the new Cicero Station.

Drivers:
A new substation in Cicero is needed to support the load growth in the Cicero area.

Customer Benefits:
This project is necessary to maintain reliability needs.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-100
Transmission – Cicero Substation Transmission Line Taps
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.09	0.09	1.4	1.1	0.0	2.7

CLCPA Marshville Temporary Substation (C093978 - $1.2M)

This project will construct a temporary 69/13.2 kV distribution substation adjacent to the Marshville Station using the Florida Station temporary transformer stored at Meco Station to provide a back-up source for the Clinton Station during CLCPA transmission construction.

Drivers:
These projects enable the rebuilding of the 115kV transmission system as part of CLCPA Phase 1 work in support of the State's clean energy goals.

Customer Benefits:
The project limits the load and number of customers at risk for an extended outage during the complete rebuilding of the 115kV transmission system in the area as part of CLCPA Phase 1 work in support of the State's clean energy goals.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-101
Transmission – CLCPA Marshville Temporary Substation
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	1.0	0.2	0.0	0.0	0.0	1.2

149/150 Reinsulating (C090704 - $1.1M)

This project will replace the deteriorated porcelain insulators on the 115kV Gardenville–Bethlehem 149/150 lines with toughened glass insulators.

Drivers:
Line reliability is the driver of this project. The 115kV Gardenville–Bethlehem 149/150 lines have a history of trips and faults.

Customer Benefits:
Replacing the insulators and insulator hardware will maintain reliability by addressing the faults caused by deteriorating insulators.

2023 to 2024 Variance:
This project was not in the 2023 plan.

Table 2-102
Transmission – 149/150 Reinsulating
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	0.0	0.0	1.1	1.1

2. G. Resiliency

While National Grid strives to maintain its assets and networks to the criteria under which they were built, much of the system was designed to standards that differ from today's. Climate change has also led to more extreme weather events. Between March and December 2021, there were eight events in NY that impacted over 400,000 customers. The increasing number and severity of such events is driving increased customer outages and outage durations.

The Company performed a desktop review of its 115kV system to identify locations where transmission upgrades could result in an improvement to survivability. This initial identification of opportunities to improve resiliency involved reviewing single supply stations that serve over 5,000 customers and areas where the loss of a single transmission line would interrupt over 10,000 customers. After reviewing the results with the Transmission Control Center system operators, an additional desktop review was conducted for areas the loss of two circuits that would interrupt over 20,000 customers. A total of ten proposals, broken into two phases, were developed to demonstrate the range of options.

Resiliency – Eastern Area (Capital Hudson and Northeast)

Spare NYE Transmission Transformers (C090951 - $9.8M)

Spare transformers are being procured to maintain the reliability of the electrical system since the procurement lead time has been growing over the past couple of years to approximately 18 months to 24 months. The recent attacks on power substations in both North Carolina and Washington State have also indicated these assets are being targeted.

Drivers:
The increasing severity of major events is driving an increased number of customer outages and longer outage durations.

Customer Benefits:
The impact of substation transformer failure events on customers could cause a long-term outage. These critical spare assets are necessary to respond to unpredictable events or failures to maintain reliable network operation.

2023 to 2024 Variance:
These projects are progressing as planned as well as new projects.

Table 2-103
Transmission – Eastern Area Resiliency
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	2.9	3.6	0.1	1.1	1.9	-	9.6
2024	-	4.0	1.0	4.8	0.0	0.0	9.8

Resiliency – Western Area (Southwest, Frontier)

Dunkirk - Falconer Resiliency (C084537 - $3.9M)

This project is to install two 115kV circuit breakers at West Ashville Station to improve automatic line sectionalizing. This work will include the installation of six in-line disconnect switches on the 115kV Transmission Line Taps to the substation and replacement of one high side take-off structure within the substation.

Huntley - Lockport Resiliency (C084538 - $3.4M)

The project is to install one in-line 115kV circuit breaker at each of the Huntley-Lockport lines to split them into two sections and to change the location of the tap connections for the Ayer Road Station and Renaissance Drive Station to balance customer exposure between each line section.

Drivers:
The increasing severity of major events is driving an increased number of customer outages and longer outage durations.

Customer Benefits:
These overhead line projects will improve transmission system sectionalizing and will result in fewer sustained outages to customers due to events on the 115kV system. These projects will improve locating faults to a smaller section of the line to improve restoration.

Spare NYW Transmission Transformers (C090950 - $4.7M)

Spare transformers are being procured to maintain the reliability of the electrical system since the procurement lead time has been growing over the past couple of years to approximately 18 months to 24 months. The recent attacks on power substations in both North Carolina and Washington State have also indicated these assets are being targeted.

Drivers:
The increasing severity of major events is driving an increased number of customer outages and longer outage durations.

Customer Benefits:
The impact of substation transformer failure events on customers could cause a long-term outage. These critical spare assets are necessary to respond to unpredictable events or failures to maintain reliable network operation.

2023 to 2024 Variance:
There is a minor rephasing and improved scope of these projects compared to the 2023 Plan.

Table 2-104
Transmission – Western Area Resiliency
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	2.3	4.3	2.9	0.2	0.0	-	9.7
2024	-	3.3	3.3	3.9	1.5	0.0	12.0

Resiliency - Central Area (Syracuse, Oswego, Cortland, Northern, Utica/Rome)

Dewitt-Tilden Resiliency (C084535 - $11.5M)

This project provides for the installation of two 115kV circuit breakers at Southwood Station and two 115kV circuit breakers at Pebble Hill Station to split the lines into three sections.

Teall-Oneida Resiliency (C084541 - $2.0M)

This project is a reconfiguration of the supplies to Peterboro Station. The substation will be supplied from both Teall-Oneida lines with an automatic transfer scheme. The project also reconfigures the connection of the Bridgeport Tap and adds supervisory (remote) control of the existing switches at the tap point.

Indian River-Indian River-Lyme Junction Line (C082190 - $52.2M); **Indian River-Lyme Junction Station (C082192 - $15.6M); Easement/Land-Indian River New 115kV (C092101 - $2.2M)**

This project consists of a new approximately 8.6 mile long line between Indian River and Lyme Junction to connect to two existing radial circuits. In addition, a new breaker will be installed at Indian River and a new ring-bus substation will be built at Lyme Junction.

Drivers:
The increasing severity of major events is driving an increased number of customer outages and longer outage durations.

Customer Benefits:
The overhead line projects will improve transmission system sectionalizing and will result in fewer sustained outages to customers due to events on the 115kV system. These projects will improve locating faults to a smaller section of the line to improve restoration.

Mobile Transformers

Mobile Substation 115-34.5-23kV 50 MVA (C090264 - $2.1M)

The mobile substation is being procured to maintain the reliability of the electrical system. The mobile will allow for coverage across upstate NY and is designed as a standard 115/34.5kV transformer in the service area. The lead time for power transformers has been growing over the past couple of years to approximately between 18 months to 24 months.

Mobile Substation 115-34.5-23kV 25 MVA (C090270 - $1.7M)

A mobile substation is being procured to maintain the reliability of the electrical system. The mobile will allow for coverage across upstate NY and is designed as a standard 115/34.5kV transformer in the service area. The lead time for power transformers has been growing over the past couple of years to approximately between 18 months to 24 months.

Drivers:
The increasing severity of major events is driving an increased number of customer outages and longer outage durations.

Customer Benefits:
The impact of substation transformer failure events on customers could cause a long-term outage. These critical spare assets are necessary to respond to unpredictable events or failures to maintain reliable network operation.

2023 to 2024 Variance:
There is a minor rephasing of these projects compared to the 2023 plan.

Table 2-105
Transmission – Central Area Resiliency
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	8.5	40.7	35.0	7.3	5.0	-	96.5
2024	-	26.4	26.9	21.2	12.5	0.4	87.3

Climate Vulnerability

In 2023, the Company completed a Climate Change Vulnerability Study and Resilience Plan to understand the impact future climate hazard projections would have on transmission and distribution assets and design standards and how to adapt to the impacts of climate change. The priority climate hazards identified for transmission assets were high temperature, wind, ice, and flooding. These priority climate hazards were chosen based on temperature data from Columbia University and NYSERDA, wind and icing data that was provided by MIT and flood risk data from the Company's Climate Change Risk Tool and FEMA flood risk designation. The projects below were chosen to upgrade assets and to better withstand increased intensity and frequency extreme weather events.

Drivers:
As a result of the Climate Change Vulnerability Study, the below projects were recommended as part of the Climate Change Resilience Plan to adapt to projected increase in frequency and intensity of climate hazards across transmission's service territory. Priority climate hazards include wind, icing, high temperature, and flooding.

Customer Benefits:
These projects will strengthen transmission structures and assets to be able to withstand more intense weather events, such as high temperatures, wind, icing, and flooding events. The spare structures will allow for a shorter restoration time for structure failures that may occur prior to upgrades.

Overhead Transmission Line Design Upgrades
Upgrade the transmission line design standard to withstand up to 120 mph wind gusts in areas of projected high winds, up from 95 mph specified by the current NESC specification. Future transmission line upgrades and rebuilds will use thicker steel, base plates, foundations, etc. as needed in areas with higher projected wind gusts.

E. Incremental Funding for Extreme Wind (C094262 - $1.9M)
C. Incremental Funding for Extreme Wind (C094263 - $0.5M)
W. Incremental Funding for Extreme Wind (C094264 - $25.2M)

Transmission Substation Transformer Specification Upgrades

Upgrade the transformer design specifications' peak average ambient temperature to 35°C (95°F), up from the present 32°C (90°F). This will allow for transformers to operate at projected average ambient temperatures for 2050 and beyond while maintaining capacity and reducing loss of life damage.

Transmission Sub CCRP XFR East (C094224 - $0.7M)
Transmission Sub CCRP XFR Central (C094225 - $0.7M)
Transmission Sub CCRP XFR West (C094226 - $0.3M)

Spare Transmission Line Structures

As wind was identified as a priority vulnerability, 10 spare 115kV transmission structures for each division (east, west, and central – 30 structures total) that are designed to withstand 120 mph wind gusts will be purchased and will replace failed structures as needed. This will help decrease restoration time and ensure replaced structures will be able to withstand projected wind gusts.

W. Spares for Climate Change (C093520 - $0.5M)
C. Spares for Climate Change (C093521 - $0.5M)
E. Spares for Climate Change (C093522 - $0.5M)

Transmission Substation Flood Walls

Install flood walls around 10 transmission substations to prevent damage to critical assets and allow substations to stay in service during flooding events.

Tran Sub Flood Mitigation – East (C093527 - $0.2M)
Tran Sub Flood Mitigation – West (C093528 - $3.4M)
Tran Sub Flood Mitigation – Central (C093529 - $6.1M)

2023 to 2024 Variance:
These projects were not in the 2023 Plan.

Table 2-106
Transmission – Climate Vulnerability
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	7.7	9.6	13.0	10.1	40.5

2. H. Communications / Control Systems

Communications and control system projects are required for building-to-building communications, microwave replacements, fiber optic installations and associated equipment.

Migrate and Update Communications Equipment

Upgrade Comm Equip Verizon Retirement (C069570 - $0.4M)
Telecomm Migration - NY East (C083766 - $16.9M)
Telecomm Migration - NY Central (C083767 - $16.9M)
Telecomm Migration - NY West (C083768 - $16.9M)

This program migrates analog, leased communication circuits to a National Grid-owned digital network to maintain protection and communication needs.

Drivers:
The protection of Company transmission circuits requires a communication path. Analog leased circuits used by National Grid are being phased out by communication providers, as evidenced by increases in monthly recurring costs and a steady decline in circuit repair services from communication providers.

The company will start migrating these analog protection circuits to Verizon digital DS1 circuits National Grid private fiber/microwave networks to maintain protection and communication needs.

A solution proposed by communication providers to lease their digital circuits does not meet all the communications requirements outlined by National Grid's Protection Engineering department. Firstly, communication providers do not have assets available at some Company substations. Secondly, on those circuits designated as bulk power system ("BPS"), the A and B protection packages require diverse circuit paths for compliance and reliability.

Customer Benefits:
The upgrading of analog communication circuits is required to comply with reliability standards. A company private network solution is also being reviewed for implementation to replace leased communications to avoid the uncertainty of third-party service providers. Moving away from copper-based circuits to fiber optics will increase network capacity and improve the reliability and resilience of our network.

2023 to 2024 Variance:
The variance from FY23 to FY24 is due to resourcing adjustments caused by increased engineering and material/labor costs.

Table 2-107
Transmission - Migrate and Update Communications Equipment
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	5.0	9.6	9.2	12.0	12.0	-	47.8
2024	-	0.5	5.6	12.0	16.5	16.5	51.0

RTU M9000 Protocol Upgrades (C069437 - $1.8M)

This program will replace an outdated Remote Terminal Unit ("RTU") protocol M9000 with a new DNP3 protocol.

Drivers:
RTUs with an M9000 protocol do not match the EMS DNP3 protocol utilized by the control centers. This could lead to a loss of communications that allow substation equipment to be operated remotely. This program is driven by the need to create a reliable communication link between the control centers and substations.

Customer Benefits:
Upgrading of M9000 protocol RTUs to DNP3 is consistent with National Grid's goal of improving reliability across its system. Proper communication between substation equipment and the control centers is critical in reducing the potential for service interruptions, equipment damage, and line overloads due to faults and for efficient operation of the transmission network.

2023 to 2024 Variance:
This program is progressing as planned. Variations in spending are updated to plan as program station work is progressing and/or scope changes are found.

Table 2-108
Transmission - RTU M9000 Protocol Upgrades
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.3	1.4	0.0	0.0	0.0	-	2.7
2024	-	1.8	0.0	0.0	0.0	0.0	1.8

DMX Projects/Programs

DMX Projects (C084525 - $2.4M)
DMX Tran Program NY Central (C093636 - $1.2M)
DMX Tran Program NY East (C093635 - $1.2M)
DMX Tran Program NY West (C093638 - $1.2M)

The purpose of these programs is to design and install new packet-based fiber equipment to replace the existing SONET-based multiplexer network ("DMX") that are nearing end-of-service life (EOL). These programs will replace outdated Alcatel/Nokia Digital Multiplexers (DMX) at approximately 37 transmission site nodes. Packet-switched technology and equipment will provide upgraded bandwidth and increased quality of service (QoS), ensuring future network expansion demands can be met.

Drivers:
The key drivers are the replacement of assets that have reached EOL and the need to incorporate new critical services onto our network. This program will allow all equipment on the company fiber backbone networks to operate on a packet-based technology dramatically increasing capacity/flexibility and allow scalability. Grid Modernization demands will be putting more services on the network such as Distributed Generation, Advanced Metering Initiative, Advanced Distribution Monitoring System, Fault Location, Isolation, and Service Restoration ("FLISR"), etc.

Customer Benefits:
Reliable communication between substation equipment and the control centers is critical in reducing the potential for service interruptions, equipment damage, and line overloads due to faults and in the efficient operation of the transmission network.

In addition to above, there are multiple customer benefits:

- Allows the Company to achieve effective integration with DERs.
- Facilitate improved and more timely information to customers, allowing them to make more efficient energy choices.
- It provides the ability to transport information from the grid to back-office systems that can drive increased system efficiency.
- Upgrade key communications to customer substations providing resiliency benefits for our larger customers.
- Facilitates innovative technologies that encourage distributed energy, two-way communications between customers and utilities, and more advanced metering solutions.
- Supports in-flight cybersecurity projects and aims to raise the security level for all communications to a common standard.

2023 to 2024 Variance:
This program is progressing as planned. Variations in spending are updated as program work progresses and/or scope changes are made.

Table 2-109
Transmission - DMX Projects/Program
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.7	1.5	2.0	2.0	2.0	-	8.2
2024	-	0.4	2.0	1.2	1.2	1.2	6.0

Verizon DS0 Replacement Programs

Verizon DS0 Replace - East (C086735 - $6.0M)
Verizon DS0 Replace - West (C086771 - $6.1M)
Verizon DS0 Replace - Central (C086772 - $6.3M)

These programs proactively transfer communications off leased DS0 circuits before these services are decommissioned by Verizon at more than 300 company sites. These projects replace existing Verizon DS0 Circuits with a combination of:

- Leased dark fiber through Competitive Local Exchange Carriers (CLEC)
- DS1 service over MPLS on Verizon Fiber
- National Grid Private Fiber optic
- National Grid Private microwave

Drivers:
The Verizon Enterprise Service Contract with National Grid for DS0 (Analog and Digital 56K) service has switched over to an off-tariff rate schedule resulting in substantial increases in the Monthly Recurring Cost (MRC) per circuit. Verizon is also currently decommissioning those circuits on an accelerated schedule and as they provide critical infrastructure protection, the company must transition to new technologies to avoid any service interruptions.

Customer Benefits:
These network upgrades will benefit the company in the following areas:

- Operational savings as leased lines are replaced with technology that is more robust, flexible and scalable.
- Operational efficiency and overall cost reduction gained from eliminating legacy telecom services.
- Creates a secure and reliable network for EMS / SCADA, relay protection, and radio.

2023 to 2024 Variance:
The projects are on track and the variance in numbers are based on changes as project scopes evolve.

Table 2-110
Transmission - Verizon DS0 Replacement
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	4.1	4.1	4.1	4.0	4.0	-	20.3
2024	-	2.2	4.1	4.1	4.1	4.1	18.4

Telecom Fiber Optic Cable ("FOC") Replacement

Boonville-Porter FOC (C088655 - $1.3M)
Reynolds-North Troy FOC (C088657 - $1.6M)
Gardenville-Arcade FOC (C088699 - $1.2M)
Geres Lock-Woodard FOC (C088700 - $1.1M)
Browns Falls-Taylorville FOC (C088701 - $1.1M)
Colton-Browns Falls FOC (C088756 - $1.3M)
Dennison-Lawrence FOC (C088757 - $1.1M)
Lawrence - Colton FOC (C088879 - $1.2M)
FOC Seneca-Gardenville (C090919 - $2.2M)
FOC Packard-Sawyer (C090921 - $5.2M)
FOC Gardenville-WRCC (C090924 - $2.9M)
FOC Lockport-Mountain (C090931 $4.8M)
FOC WRCC-Lockport (C090935 - $6.6M)
FOC Packard-New Rd SC-Niagara (C090945 - $4.9M)
FOC Alabama-Telegraph-SS (C094074 - $5.8M)
FOC Sweden-Brock-Mortimer (C094075 - $7.5M)
FOC SE Batavia-BSC-LeRoy (C094076 $4.6M)
FOC Eastover-Bear Swamp (C094121 – $0.5M)

Incumbent Local Exchange Carriers ("ILEC") are disconnecting traditional copper circuits necessitating National Grid to maintain and grow reliable and secure communication links between our control centers and substations.

Drivers:
These projects support our goal to privatize the company fiber network by installing new fiber throughout the upstate NY transmission system. These new fiber segments will provide secure and reliable protection, EMS, SCADA, network traffic between substations and Company facilities across upstate New York.

Customer Benefits:
These projects are driven by the need to create a more reliable, secure, and modern communication link between the control centers and substations across upstate New York. The Company must meet the increased demands of EMS, SCADA, and Tele-Protection needs while working towards our strategic goal of a secure privatized fiber network.

2023 to 2024 Variance:
The variance from FY23 to FY24 is due to resourcing adjustments caused by increased engineering and material/labor costs. Also, the addition of new FOC projects increased the cost as well.

Table 2-111
Transmission – Telecom FOC
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.7	0.8	4.4	4.1	4.5	-	14.5
2024	-	2.3	7.3	9.7	16.2	19.3	54.8

Telecom T Dark Fiber

Telecom T West Dark Fiber (C091294 - $9.2M)
Telecom T Central Dark Fiber (C091295 - $8.0M)
Telecom T East Dark Fiber (C091301 – $9.5M)

The Company needs to maintain and grow a reliable communication link between the control centers and substations. Communication providers are retiring and no longer supporting repairs to older communication circuits.

Drivers:
Dark Fiber Indefeasible Right to Use ("IRU") procurement will be used to convert the existing Incumbent Local Exchange Carriers ("ILEC") DS0 (56kb/s) leased line protection and EMS circuits for 69kV, 115kV, and 230kV substations in Upstate New York. Leasing Dark Fiber will fulfill this need and it will allow for a more secure intranet with dedicated National Grid Fiber. Additional Capacity needs in the future can be more easily obtained by simply adding equipment to the National Grid dedicated Fiber Optic Strands. National Grid's increased demands on tele-protection requires low latency performance of the communication networks serving the Company. National Grid is now prioritizing and replacing existing leased line communication

circuits with Company owned Fiber, Dark Fiber IRU, and shared (with other Power Utilities only) fiber communications.

Customer Benefits:
These projects are driven by the need to create a more reliable, secure, and modern communication link between the control centers and substations across upstate New York. National Grid must meet the increased demands of EMS, SCADA, and Tele-Protection needs while working towards a more secure privatized fiber network.

2023 to 2024 Variance:
The projects are proceeding as planned and the variance between FY23 and FY24 is based on changes as the project scopes refine and integrate with our private fiber network expansion.

Table 2-112
Transmission – Telecom T Dark Fiber
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	6.0	6.0	6.0	6.0	6.0	-	30.0
2024	-	4.6	3.9	6.1	6.1	6.0	26.7

Telecom Migration

Telecom Migration (C088867, C088868, C088869, C088870, C088871, C088875: $1.4M)

The six funding projects for telecom migration are for Gardenville, Woodard, Colton, Porter, Taylorville and Reynolds Road stations (FP in that order). These projects are to install conduit and handholes into these substations prior to installing new fiber-optic cable.

Drivers:
Analog and Digital (56k) leased copper-based circuits from Verizon are used by National Grid for relay protection on company transmission circuits. Verizon is actively decommissioning these leased circuits. These circuits are necessary to protect the company's transmission line, substation and underground cable assets from fault conditions. National Grid is currently migrating these leased circuits to the company's private fiber/microwave networks or utilizing local exchange carriers (CLEC).

Customer Benefits:
National Grid must transition to a new technology for copper circuits that consist of Energy Management System, Gas Energy Management System, Relay Protection, Radio, IT, SCADA, and Telemetry on obsolete technology. The sites represent electric distribution, and electric transmission. Without communication circuits, there are no SCADA, EMS, or Tele-Protection communications that allow substation equipment to be operated remotely. This program is driven by the need to continue to provide a reliable communication link between the control centers and substations with existing copper circuit retirements.

2023 to 2024 Variance:
The projects are on track and the variance in numbers from FY23 to FY24 is based upon individual project scope changes.

Table 2-113
Transmission – Telecom Migration
Projects Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	0.7	0.0	0.0	0.0	-	1.1
2024	-	0.0	0.7	0.7	0.0	0.0	1.4

Nokia 1830 Photonic Service Switch ("PSS")

LH DWDM Upgrade West (C088135 - $3.5M)
LH DWDM Upgrade Cent (C088866 - $3.5M)
LH DWDM Upgrade East (C088954- $3.5M)
DWDM Syracuse Metro (C089112 – $0.1M)

NG needs to maintain and grow a reliable communication link between the control centers and substations. Replacement of obsolete communication equipment supports the performance, reliability, and security of the communication links.

Drivers:
These projects upgrade existing 10GB/s Nokia 1830PSS / DMX color interface into a 100GB/s Nokia 1830PSS Long Haul Dense Wave Division Multiplexer with enough 10GB/s ports to support both the DMX and Belden as parallel systems at ring nodes in the upstate New York to support the DMX SONET existing circuits conversion to the Belden Multiprotocol Label Switch ("MPLS") supporting the Company initiative to remove the EOS (End of Service) and EOL (End of Life) DMX SONET from the National Grid Network. Spare parts are either in short supply or no longer available.

Customer Benefits:
This project enables the replacement of the obsolete DMX equipment currently in use with new technology allowing more reliable and faster communication of the network.

2023 to 2024 Variance:
These projects are being added to address communication upgrades, replacements, and future needs identified for the Nokia 1830 PSS equipment through FY29 by engineering groups with work starting in FY24.

Table 2-114
Transmission – Nokia 1830 PSS
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.8	0.5	0.0	0.0	0.0	-	1.3
2024	-	0.1	1.5	3.0	3.0	3.0	10.6

FAS, ProVision, Server, KVM (C089548 – $4.0M)

Drivers:
The Company currently employs many Aviat Microwave Systems in Upstate NY. Due to the FCC opening the 6 GHz band to unlicensed use, the Company is actively replacing any other 6 GHz systems with Aviat 6 GHz radio systems. The need to monitor and control the possibility of

interferences is increasing. This project will install and commission equipment with software for the Aviat Microwave equipment which will provide the following functionality

- Remote system control
- System monitoring
- Interference detection
- Trend analysis of the network

Customer Benefits:
This project will bring ability to better monitor and control the Company owned Aviat Microwave communication system. This will reduce outages and maintenance windows, leading to lower costs for network management and operation.

2023 to 2024 Variance:
The variance between FY23 and FY24 is due to the refining of individual project scopes.

Table 2-115
Transmission – FAS, ProVision, Server, KVM
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.5	0.5	0.8	0.8	0.7	-	3.3
2024	-	0.3	0.6	0.8	0.8	1.5	4.0

Microwave Radio Network

Microwave Radio Network NY Central (C093820 – $2.8M)
Microwave Radio Network NY East (C093818 – $2.8M)
Microwave Radio Network NY West (C093819 – $5.1M)

Rebuilding/upgrading the existing microwave network will allow the preservation of current coverage and the expansion into areas that are cost-prohibitive for fiber coverage. In transitioning to a packet-based microwave model, the Company would be able to make maximum use of the available licensed spectrum. This next generation radio technology allows software control of throughput up to 1Gb/s capacity, QoS benefits and back/dual compatibility with SONET/TDM based systems. Microwave systems can easily be designed to operate at 99.9999% reliability while also delivering the low latency required for protection switching.

Drivers:
The National Grid private microwave network handles critical communications from company assets that do not have terrestrial-based fiber connectivity. The microwave system also provides reliable and redundant path in places that have no fiber option. The existing microwave assets are nearing end-of-life and with product lines being discontinued, the availability of parts has become a major concern.

Customer Benefits:
Reliability is a fundamental requirement for our communication network when transporting mission-critical information. Key factors that will improve are redundancy, QoS, proactive monitoring, enhanced fault tolerance and weather resilience which will ultimately minimize service interruptions.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-116
Transmission – Microwave Radio Network
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	2.3	1.3	3.6	3.6	10.8

Radio Comms Systems

Radio Comms Systems T Central (C093841 – $3.2M)
Radio Comms Systems T East (C093840 – $4.1M)
Radio Comms Systems T West (C093842 – $4.6M)

The land mobile radio ("LMR") system is an important communications tool for storm restoration and blue-sky field operations. The first step of the program is a systemwide upgrade which will enable the Company LMR storm channel plan such that any line truck in the state can travel to any area during a storm and be able to communicate on the LMR system with other Company crews and service centers.

The second step is the implementation of a new LMR dispatch console system. Service centers use the console system to communicate with individual and/or groups of trucks in the field. This capability is important during switching operations, dispatching work crews and code blue emergency response. The current console system relies on older technology and lacks the capabilities of modern dispatch systems.

The third step is upgrading all the tower equipment including but not limited to radio transceivers, DC power plant, radio shelters, power back-up generators, radio towers and antennae.

Drivers:
The LMR system and associated telecom infrastructure have been in service for many years and component failure, obsolescence and storm damage have contributed to the wear and tear on the system. Replacements and upgrades are required and prioritized annually to keep the system functioning as designed and maintain the reliability of voice communications for National Grid field personnel.

Customer Benefits:
Reliable voice communications from field personnel to control centers and corporate offices is needed to support efficient execution of substation and power line construction, switching, maintenance, and storm restoration work. The LMR system directly supports the company's ability to maintain the reliability of the electric networks. Our crews rely on this system for daily operations and safety. An example is the code-blue emergency procedure, where voice communications are used to provide details to the dispatch center when there is a health and safety emergency in the field.

2023 to 2024 Variance:
These projects were not in the 2023 Plan.

Table 2-117
Transmission – Radio Comms Systems
Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	2.1	1.4	4.2	4.2	11.9

Spier Falls ADSS Fiber to Sodeman (C091012 - $1.4M)

The Company has OPGW fiber that runs from the Spier Falls Station on the T7070 line to Transmission Structure (113A) in the ROW, where it is coiled up. This project's scope is to install fiber from Transmission Structure (113A) to the Sodeman Station.

Drivers:
This aligns with our strategy to privatize communications with a Company-owned fiber optic network that is dedicated to our inter-substation traffic.

Customer Benefits:
This is a station-to-station fiber interconnect necessary to establish a redundant path for our Protection and EMS traffic in the Eastern region.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-118
Transmission - Spier Falls ADSS Fiber to Sodeman
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.02	0.2	1.2	0.0	0.0	1.4

Batavia - Telecom Ring Protection (C085421 - $6.6M)

DWDM and spare fibers are required to migrate and replace the obsolete SONET DMX equipment at existing substations. The current fiber count to Batavia is insufficient for the DMX replacement and for parallel network operations. The DMX locations of Batavia Service Center, Batavia Station 01, and Southeast Batavia Station can only be migrated if additional fiber is available.

The existing shortfall in diverse fiber capacity is limiting privatization of both A and B packages for tele-protection capabilities at Company substations. It will be resolved by establishing a diverse route ring for Oakfield Station, Batavia Station 01, Southeast Batavia Station, and Batavia Service Center / Radio Shelter.

Drivers:
This project is necessary to replace the obsolete and unsupported DMX equipment and address the lack of diversity in the working and protection paths. Once completed, it will add two diverse paths for redundancy. Currently, Batavia Station 01 is only using a serial radio connection which puts the existing protection path at risk if that link fails.

Customer Benefits:
Upgrading to a diverse fiber path will result in improved critical operational services, including network monitoring and control, outage response, metering services, and security protocols and services.

2023 to 2024 Variance:
The project is progressing according to scope and the variance in numbers is based on changes as the project evolves.

Table 2-119
Transmission - Batavia - Telecom Ring Protection
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	1.0	3.4	2.2	0.0	-	6.7
2024	-	0.2	0.5	1.2	2.3	2.4	6.6

2. I. Non - Infrastructure

Non-Infrastructure capital expenditures are for items that are not part of the electric power system but are required to run the Company network communications equipment.

LMR Land Mobile Radio System - Transmission (C086663- $1.0M)

This program is for the annual purchase of mobile communication radios for installation into crew vehicles. The current mobile radio communications in our vehicles will not be supported by the vendor in the future. When upgrades are completed, the new technology will improve security, and compatibility with other vendors.

Drivers:
The Company needs to maintain the radio network with the latest technology for reliability and secure communications. This will maintain redundancy in radio communications, if we have a major outage with our landline and/or cellular communications.

Customer Benefits:
This program will support communications between the field and control center and help in coordination during a weather event, which will speed up restoration efforts.

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-120
LMR Land Mobile Radio System - Transmission
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.2	0.2	0.2	0.2	02	1.0

2. J. EV Fleet – Local Supplemental

Transmission EV Fleet – (C089362 - $55.3M)

These projects are needed to support large EV charging demand from fleet operators. New York is implementing ambitious zero-emission medium- and heavy-duty vehicles ("MHDV") goals. Most recently, Governor Hochul announced rules for increasing sales of zero-emission MHDVs beginning in 2025.[6] This is in addition to a September 2021 law requiring 100% zero-emission new MHDV sales by 2045, and a July 2020 Memorandum of Understanding ("MOU") with other states to transition to zero-emission MHDVs, including 50% of sales by 2030.[7] Moreover, major fleet operators have announced plans to convert their vehicles to clean fuels in similar timeframes. While hydrogen was once viewed as an opportunity to decarbonize transportation, particularly heavy-duty vehicles, advances in electric vehicle technology in the medium and heavy-duty sector supports the fact that the vast majority of vehicles will be battery electric.

Drivers:
The projected investment relates to new transmission infrastructure to support large EV fleets (delivery vehicles, school buses, freight shipping, etc.) due to the large electric demand their charging needs will create. Because fleets will require large numbers of chargers and often are "clustered" in specific areas, the impacts can be significant and vary substantially on different parts of the system.

Customer Benefits:
This will support fleet customers seeking to convert to electric vehicles by readying the electric grid for their needs, which will be significant points of new load. This will enable customers to purchase new vehicles and install charging equipment faster and with fewer impacts on electric networks. These investments will prepare 'Grid Ready' areas where fleets are clustered and will cumulatively require new distribution and transmission infrastructure.

2023 to 2024 Variance:
The variance is primarily driven by the funding in FY28 (last year's Capital Investment Plan ("CIP") only went through FY27), as well as improved estimates based on advanced EV fleet and highway load forecasting studies that have progressed in the last year. Through analysis of a machine learning model, telematics data from Daimler Trucks, geospatial analysis, and Electric Power Research Institute's EVs2Scale database the Company now has improved visibility of where fleets are clustered, which informs where distribution and transmission upgrades will be required. The Company has also released public studies[8] on how vehicle fleet clusters transitioning to

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[6] *See "Governor Hochul Announces Adoption of Regulation to Transition to Zero-Emission Trucks," Dec. 30, 2021; https://www.governor.ny.gov/news/governor-hochul-announces-adoption-regulation-transition-zero-emission-trucks (last accessed Jan. 23, 2022).*

[7] *See "In Advance of Climate Week 2021, Governor Hochul Announces New Actions to Make New York's Transportation Section Greener, Reduce Climate-Altering Emissions," September 8, 2021; https://www.governor.ny.gov/news/advance-climate-week-2021-governor-hochul-announces-new-actions-make-new-yorks-transportation (last accessed Jan. 23, 2022); see also "Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding; https://www.nescaum.org/documents/mhdv-zev-mou_12-14-2021.pdf/ (last accessed Jan. 23, 2022).*

[8] *See "The Road to Transportation Decarbonization: Understanding Grid Impacts of Electric Fleets", Sep., 2021; "The Road to Transportation Decarbonization: Readying the Grid for Electric Fleets," Sep., 2023. https://www.nationalgridus.com/News/National-Grid-and-Hitachi-Energy-Transportation-Decarbonization-Study-Highlights-Path-to-Readying-the-Grid-for-Electric-Fleets/*

electric will impact distribution and transmission circuits. Those studies support that this forecast, which has been determined to be a more reasonable ramp rate.

Table 2-121
Transmission – Transmission EV Fleet – Local Projects
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	3.0	5.0	15.0	-	23.0
2024	-	0.0	5.4	10.7	10.7	28.5	55.3

2. K. CLCPA Phase 2A – Regional

These projects are designed to address both National Grid system needs, and State transmission needs to integrate renewable generation and storage. These projects will be funded by National Grid ratepayers and contributions from outer Transmission and Distribution Companies' ratepayers throughout the State.

Drivers:
The New York State mandate to get 70% of energy from renewable sources by 2030 and achieve a 100% emission free grid by 2040 will require not only a large number of new renewable generators and storage, but also investment in the transmission and distribution systems. National Grid studies have shown that the transmission system in many of the areas of highest renewable generator interest is not capable of delivering power from the generators to the loads, both local and statewide. These projects are designed to address transmission system limitations and correct the curtailment of renewable generation.

Customer Benefits:
These projects allow for additional renewable energy to reach the customers in support of the State's clean energy goals.

CLCPA – MVT Generator Additions
This program constructs reinforcements to the system to strengthen the transmission network, ensure adherence to reliability standards and provide for the unbottling of solar (photovoltaic) and land based wind generation.

Marshville New Substation (C090032 - $60.6M) and Marshville TLine New Substation (C090046 - $12.9M) –

These projects provide for a new 345-115kV substation interconnecting National Grid's 115kV system to LS Power's 345kV Edic-Princetown circuits. This project will construct a new 345kV/115kV station in a breaker and a half configuration for the 345kV and 115kV yards with two transformers tying the yards together. There will be four 115kV line bays, four 345kV line bays, and a spare 115kV bay. This station will require two 345/115kV 448 MVA transformers, six 13.2kV single-phase disconnect switches, nine 115kV 3000A circuit breakers, 24 115kV CCVTs, 26 115kV 3000A manual operated switches, nine 345kV, 4000A circuit breakers, 28 345kV CCVTs, four 345kV, 4000A BIL line traps, 12 345kV 4000A CT/VTs, 12 345kV 220kV MCOV Surge arrestors, and 24 345kV 4000A motor operated switches. This work includes all site preparation, civil work, and fencing installation. The equipment and control enclosure will both implement IEC-61850 protocols. Four existing transmission circuits will be looped in-and-out of

the substation requiring the removal of four structures and approximately 1,000 feet of conductor and the installation of 16 structures as well as the installation of approximately 12,000 feet of new conductor and 3,800 feet of new shield wire.

Clay Station Upgrades (C090006 - $4.3M)

This project is required to increase the thermal capability of the station equipment to match the associated transmission line rating. This project will relocate the bussed portion of Line 7 to become the second 115kV transmission line terminating at the position presently occupied by the Line 5 at the Clay Station. This will require the replacement of six existing circuit breakers R50, R875, R140, R70, R865, and R110 with new 115kV, 3000A circuit breakers and 14 gang-operated disconnects. The new Line 5 position will require one new 115kV 2000A circuit breaker with gang operated disconnects will be installed between R180 and R115. The #5 bay will also require the installation of one set of three 115kV CCVTs and one new set of 115kV 2000A gang operated disconnects with arching horns. The overhead strain bus and the connections between breakers and nearby disconnects will be replaced in the 115kV #5, #6, and #7 bays with new 2-1272 AAC.

East Ave Station - Greenfield (C090027 - $14.9M)

This project will construct a new 115kV four breaker ring bus transmission station along the right-of-way for the South Oswego-Nine Mile Point 1 line south of East Ave where the South Oswego-Indeck 6 and the Indeck-Lighthouse Hill 2 lines head north towards Indeck. The new substation is expected to connect a total of four 115kV lines; one 115kV line back to South Oswego, one line to Lighthouse Hill, and two lines up to the Indeck station. This substation will require 14 sets of 115kV, 3000A gang-operated switches, four 115kV, 3000A circuit breakers, two sets of three 115kV, 1200A fused hook-stick switches,12 115kV coupling capacitor voltage transformers (“CCVT”), and two sets of three 115kV surge arresters. This work includes all site preparation, civil work, and fencing installation. The equipment and control enclosure will both implement IEC-61850 protocols.

Lighthouse Hill – Clay Rebuild (C090028 - $194.0M)

This project will rebuild the 26.6 miles bussed 115kV Lighthouse Hill–Clay 7 line as two single circuits. This will require the removal of 177 existing structures. The project will install 86 engineered steel structures on foundations for angle, dead-end, and switch structures and 488 direct embed steel suspension structures. The existing conductors will be replaced with 52.2 circuit mi of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed on each line. Replace two existing switches with vertical load break 3000A switches.

Lighthouse Hill – S. Oswego Rebuild (C090029 - $186.1M)

This project will rebuild the 27.3mi of double circuit and 1.2 miles of single circuit sections of the Lighthouse Hill-South Oswego corridor. This includes the South Oswego–Nine Mile Point 1, Lighthouse Hill-Indeck 2, Fitzpatrick – Lighthouse Hill 3, & South Oswego–Indeck 6 lines. This will require the removal of 264 existing structures. The project will install 30 double circuit engineered steel structures on foundations for angle, dead-end, and switch structures and 217 double circuit direct embed steel suspension structures. The project will install 16 single circuit engineered steel structures on foundations for angle, dead-end, and switch structures and eleven 11 single circuit direct embed steel suspension structures. The existing conductors will be replaced with 52.2 circuit miles of bundled 636 ACSS conductors. The existing shield wire will be

replaced with 3/8” EHS shield wire and 1/2" 48 fiber OPGW. Existing switches will be replaced with vertical load break 3000A switches. A redundant ADSS fiber communication path will be installed on 35ft wood poles along the edge of the corridor.

Maiden Lane station - Greenfield (C090031 - $21.8M)

This project will construct a new 115kV transmission substation along the right-of-way for the Indeck-Lighthouse Hill 2 and South Oswego-Nine Mile Point 1 lines east of Maiden Lane Rd. The new substation will have a breaker and a half configuration. The new substation is expected to connect a total of six 115kV lines; two 115kV lines back to South Oswego Station, two lines to Lighthouse Hill Station, and one each to the Nine Mile Point and Fitzpatrick stations. This substation will require 28 sets of 115kV, 3000A gang-operated switches, 12 115kV, 3000A circuit breakers, two sets of three 115kV, 1200A fused hookstick switches, 24 115kV CCVTs, two 115kV 50 MVAR two-stage capacitor banks, two sets of three 115kV reactors, and two sets of three 115kV surge arresters. This work includes all site preparation, civil work, and fencing installation. The new station and control enclosure will both implement IEC-61850 protocols.

South Oswego Station Upgrades (C090052 - $2.2M)

This project is required to increase the thermal capability of the station equipment to correspond with the associated transmission line rating. This project will replace two existing circuit breakers R10 and R60 with new 115kV, 3000A circuit breakers and the four gang-operated disconnects #11, #13, #61, and #63 with new 115kV 3000A gang-operated disconnects with arcing horns. The existing conductor drops from the line terminations to the breaker R10 and R60 will be replaced with new 2-1272 AAC. This station will also require the replacement of the RTU along with new digital line relaying, metering and control handles for lines #1 and #6.

Black River – LHH Rebuild (C089996 - $232.5M)

This project will rebuild the existing 35.6 miles double circuit Black River – Lighthouse Hill 115kV corridor as two single circuit lines. These include the Black River – Lighthouse Hill 5 (T2120), Black River – Middle Road 8 (T6940), and Middle Road – Lighthouse Hill 6 (T6950) Circuits. This will require the removal of 347 existing structures. The project will install 46 engineered steel structures on foundations for angle, dead-end, and switch structures and 595 direct embed steel light duty suspension structures. The existing conductors will be replaced with 70.8 miles of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed on each line. Replace four existing switches with 3000A switches.

Black River – Taylorville Rebuild (C089997 - $177.1M)

This project will fully rebuild the 26.1 miles double circuit 115kV T3060 Black River–Taylorville 2, T3050 Black River–North Carthage 1, T6270 North Carthage–Taylorville 8 lines as two single circuits in the same corridor. This will require the removal of 256 existing structures. The project will install 100 engineered steel structures on foundations for angle, dead-end, and switch structures and 382 direct embed steel suspension structures. The existing conductors will be replaced with 52 miles of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed on each line. Replace two existing switches and install two vertical load break 3000A switches.

Black River Substation Upgrades (C090000 - $5.0M)

This project is required to increase the thermal capability of the substation equipment with the associated transmission line rating. This project will replace the five existing 115kV 1600A circuit breakers R10, R20, R30, R50, and R80 with new 115kV, 3000A circuit breakers and disconnect switches. This project will also install one new 115kV 3000A series bus tie breaker. The existing conductor drops from the 115kV Black River-North Carthage 1, Black River-Taylorville 2, Coffeen-Black River 3, Coffeen-Black River-Lighthouse Hill 5, and Black River-Middle Rd lines 8 takeoff structures to the new line disconnects and line's breaker will be replaced with new 2-1272 AAC. New 5" AL tube bus, including foundations and steel structure will be installed for the new "B" bus sections required to accommodate the new series bus tie breaker.

Coffeen– Black River Rebuild (C090008 - $42.9M)

This project will rebuild the 7.5 miles single circuit 115kV Coffeen-Black River 3 (T3120) line. This will require the removal of 76 existing structures. The project will install 16 engineered steel structures on foundations for angle, dead-end, and switch structures and 60 direct embed steel suspension structures. The existing conductors will be replaced with 7.5 miles of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed. Replace one existing switch with vertical load break 3000A switches. A redundant ADSS fiber communication path will be installed on 35ft wood poles along the edge of the corridor.

Coffeen – East Watertown Rebuild (C090009- $47.6M)

This project will rebuild the 7.5 miles single circuit and 2.0 miles double circuit sections of the 115kV T2120 Coffeen–Lighthouse Hill–Black River 5 line. This will require the removal of 163 existing structures. The project will install 19 single circuit engineered steel structures on foundations for angle, dead-end, and switch structures and 110 single circuit direct embed steel suspension structures. The project will also install six double circuit engineered steel structures on foundations for angle, dead-end, and switch structures and 25 double circuit direct embed steel suspension structures. The existing conductors will be replaced with 9.5 miles of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed on each circuit. Install one vertical load break 3000A switches. A redundant ADSS fiber communication path will be installed on 35ft wood poles along the edge of the corridor.

Coffeen – Lyme Junction Rebuild (C090010- $41.5M)

This project will rebuild the 7.4 miles single circuit section of the 115kV Thousand Islands-Coffeen 4 (T3350) line from Coffeen Station to Lyme junction. This will require the removal of 73 existing structures. The project will install 15 engineered steel structures on foundations for angle, dead-end, and switch structures and 58 direct embed steel suspension structures. The existing conductors will be replaced with 7.4 miles of bundled 636 ACSS" conductors. New 1/2" 48 fiber OPGW will be installed. Replace one existing switch with vertical load break 3000A switches. A redundant ADSS fiber communication path will be installed on 35ft wood poles along the edge of the corridor.

Coffeen Synchronous Condensers (C090023- $98.1M)

This project will expand Coffeen Station to install two 150 MVAR Synchronous Condensers. The Synchronous Condenser assembly includes the step-up transformer, secondary circuit breaker,

cooling fans, generator and the enclosure. Two sets of 115kV 2000A disconnects with be installed and a new 2-795 ACSR overhead bus section will be required to connect one Synchronous Condenser to the East bus. This work includes all site preparation, civil work, and fencing installation.

Colton – Malone #3 Rebuild (C090024 - $61.3M)

This project will rebuild the 18.3 miles single circuit section of T3170 115kV Colton-Malone 3 line between the Colton Station and the Nicholville Station. This will require the removal of 197 existing structures. The project will install thirty engineered steel structures on foundations for angle, dead-end, and switch structures and 165 direct embed steel suspension structures. The existing conductors will be replaced with 18.3 miles of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed. Replace two existing switches with vertical load break 3000A switches. A redundant ADSS fiber communication path will be installed on 35ft wood poles along the edge of the corridor.

Colton Station Term Equip Upgrade (C090025 - $0.5M)

This project is required to increase the thermal capability of the substation equipment to correspond with the associated transmission line rating. This project will replace existing disconnects #34 with new 115kV 1200A rated disconnects, replace the existing current limiting conductors in the line #3 bay with new 1272 45/7 ACSR. and replace the main bus conductors near the line #2, 3, 5, and 8 connections to with 1000MCM 37 strand copper conductors.

McIntyre – Colton DLR (C090047 - $0.7M)

This project will install dynamic line rating equipment on 18 spans of the 115kV McIntyre-Colton 8 line including any work required for access and EMS integration.

Taylorville Station – BAAH Greenfield (C090053- $142.4M)

This project will rebuild Taylorville Station on a greenfield location. A breaker and half arrangement will be used for the 115kV equipment. The new 115kV equipment will include one 115kV:23kV, 20/26/33 MVA transformer with LTCs, two new 150 MVA 115kV Synchronous Condensers, 16 3000A circuit breakers, 41 sets of 3000A gang-operated switches, and 36 CCVTs. The new 23kV equipment will include one 2000A VCB, five 1200A VCBs, one set of 2000A, gang-operated switches, 11 sets of 1200A, gang-operated switches, one set of 23kV, 1200A fused hookstick disconnect switches, and five single-phase 23kV PTs, one for each 23kV line. This work includes all land acquisition, site preparation, civil work, and fencing installation. The equipment and control enclosure will both implement IEC-61850 protocols with all new relaying and controls.

Taylorville – Boonville Rebuild (C090050 - $221.0M)

This project will rebuild the 33.9 miles double circuit 115kV T3320 Taylorville–Boonville 5 and T3330 Taylorville–Boonville 6 lines as two single circuit lines. This will require the removal of 315 existing structures. The project will install 117 engineered steel structures on foundations for angle, dead-end, and switch structures and 516 direct embed steel suspension structures. The existing conductors will be replaced with 68 miles of bundled 636 ACSS conductors. New 1/2" 48

fiber OPGW will be installed on each line. Replace four existing switches with 3000A vertical load break switches.

Middle Road Station – Six Breaker Ring (C090051 - $23.5M)

This project will convert Middle Rd. Station to a six-breaker ring substation. This requires the installation of new 3-1/2" AL tube bus three A-frame take-off & disconnect switch structures. Three new 3000A 115kV circuit breakers, seven new sets of 115kV 3000A gang operated disconnect switches, and three sets of three-phase CCVTs will be installed. The existing seven sets of gang-operated disconnect switches 82, 83, 61, 62, 63, 816, and 817 will be replaced with new 115kV 3000A gang-operated disconnects. All new digital line relaying, control, and metering will be installed for the three new lines connecting to the station.

Boonville – Porter Rebuild (C090003 - $190.1M)

This project will rebuild the 115kV T4020 Boonville–Porter 1 and the T4030 Boonville – Porter 2 lines as two single circuit lines. This will require the removal of 287 existing structures. The project will install 79 engineered steel structures on foundations for angle, dead-end, and switch structures and 451 direct embed steel suspension structures. The existing conductors will be replaced with 52 miles of bundled 636 ACSS conductors. New 1/2" 48 fiber OPGW will be installed on each line. Replace two existing switches with vertical load break 3000A switches.

Boonville – Substation Upgrades (C090005 - $29.5M)

This project will install two 115kV 200 MVA phase angle regulators ("PARs") on the 115kV Boonville-Rome 3 & 4 lines at the future Boonville Greenfield Station location. This will also require the installation of four new 115kV 2000A circuit breakers, eight sets of 115kV 1200A disconnects, four single-phase 69kV CCVT. Four A-frame take-off & disconnect switch structures with be installed along with all required structures, foundations, and site work required to support the equipment being installed.

2023 to 2024 Variance:
The project scopes and estimates have been refined as the projects have progressed.

Table 2-122
Transmission – CLCPA Phase 2A – Regional
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	8.6	54.8	158.0	554.5	610.6	-	1386.2
2024	-	213.8	300.8	556.8	466.1	273.0	1810.5

2. L. FERC Public Policy - Regional

The FERC Public Policy investment levels are based on work to support or partially implement FERC Order 1000 competitive, public policy projects. These projects can be directed by the Commission outside of a rate case or may require upgrades of National Grid facilities as part of competitive transmission projects. In each case, the projects are incremental to the Company's rate case investment plan. Cost recovery for these projects is outside of traditional bundled retail transmission and distribution rates as they ultimately benefit a larger portion of the State.

There is very limited spend in FY2025 for project close out of Energy Highway Initiative ("EHI"). There are no projects of this category in FY2026-2029 currently.

2. M. Priority Transmission Projects – Regional

Smart Path

Smart Path Connect - Transmission Line (C088956 - $232.3M)

NYPA was authorized to develop Priority Transmission Projects in the 2020 NYS Budget Part JJJ legislation and to solicit partners for the development of such projects. The costs of these projects will be allocated and recovered by the NYISO. The National Grid project investments presented in the Plan are the result of being selected by NYPA as its partner in Priority Transmission Projects. The NYISO Priority Transmission Projects extends between Adirondack-Porter, and from the north end of Smart Path in the Town of Massena east along the 230kV corridor to Willis and then on to Patnode and Ryan. National Grid will construct 345kV transmission lines along the 55 mile right of way between Adirondack-Marcy, Adirondack-Austin Road, Austin Road-Edic and extend the Rector Rd-Chase Lake 10 line to a new transmission substation at Austin Road. The existing 230kV substation yard at Porter Station will be partially removed and Chases Lake Station will be completely removed. A new 345kV substation will be built at Austin Road, and the Edic Station will be modified. In addition, approximately one mile of 230kV from the existing Chases Lake Station to the site of Austin Road Station will be built. At this point in time, the substation projects are nearing completion with only the transmission line spend remaining in this edition of the Capital Investment Plan.

Drivers:
This project is a part of New York Power Authority's Priority Transmission Project known as Smart Path Connect.

Customer Benefits:
This project supports the State's Clean Energy Goals.

2023 to 2024 Variance:
These projects are progressing as planned within the transmission outage constraint windows.

Table 2-123
Transmission - Smart Path Connect - Transmission Line
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	185.5	140.1	60.4	13.1	0.0	-	399.0
2024	-	153.3	66.3	12.7	0.0	0.0	232.3

2. N. Interregional Intertie Projects – Regional

Interregional Intertie - Line (C094532 - $50.0M)

National Grid is planning to upgrade an existing 230kV transmission line that crosses the New York-New England border to 345kV. This project is wholly contingent on Department of Energy (DOE) funding through the Infrastructure Investment and Jobs Act (IIJA) Grid Resilience and Innovation Partnership (GRIP) solicitation, kicking off in January of 2024. This project will include the rebuild of 44 miles of 230kV, including replacement of all structures.

Drivers: This project is driven by customer benefits, particularly those related to clean energy transition market efficiencies. This project also meets asset condition needs, as these structures and conductors are of 1960's vintage.

Customer Benefits:
Customer benefits include: 1) improved resiliency in the event of extreme weather events, 2) market efficiency benefits in excess of project costs based on production cost modeling under policy compliant future scenarios, and 3) reduced overall cost to customers as a result of the potential federal subsidy (up to 50% of project costs).

2023 to 2024 Variance:
This project was not in the 2023 Plan.

Table 2-124
Transmission - Interregional Intertie - Line
Project Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.0	5.0	5.0	40.0	50.0

Chapter 3: Sub-Transmission System

The sub-transmission system is comprised of lines and substations typically operating at 46kV, 34.5kV, 23kV, 13.2kV, and 12kV. National Grid has approximately 2,900 circuit miles of overhead ("OH") sub-transmission lines and 656 circuit miles of sub-transmission underground ("UG") cable. To serve the needs of customers over the five-year period covered by this Plan, the Company expects to invest $657.9 million on the sub-transmission system, as shown in Table 3-1 below.

Table 3-1
Sub – Transmission System Capital Expenditure by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Request/Public Requirement	2.8	2.3	1.6	2.5	3.5	12.7
Damage/Failure	4.3	4.3	4.8	4.6	4.3	22.4
System Capacity – NY	0.8	15.6	17.3	38.2	37.5	109.4
Asset Condition	27.3	56.5	58.9	54.5	55.1	252.1
Multi Value Distribution (MVD)	3.0	10.8	18.0	19.6	26.3	77.7
Reliability	1.6	3.9	2.2	13.0	8.8	29.6
Resiliency	5.6	25.5	28.0	31.5	17.9	108.5
DER Electric System Access	0.0	0.1	0.5	9.0	36.0	45.6
Local Spending Total	**45.3**	**119.1**	**131.2**	**172.9**	**189.5**	**657.9**
Grand Total	**45.3**	**119.1**	**131.2**	**172.9**	**189.5**	**657.9**

A list of sub-transmission projects in the Plan can be found in Exhibit 2.

3. A. Customer Request / Public Requirements

Customer Request / Public Requirements investment levels are primarily based on trends as well as specific known projects. These estimates reflect consideration of inflation, estimates of materials, labor, indirect cost, market sector analysis, overall economic conditions, and historical activity.

Variances in planned program spending between the 2023 and 2024 Plans are shown in Table 3-2.

Table 3-2
Customer Request / Public Requirement Spending Rationale Variance ($Millions)

	CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
Blankets	2023	0.1	0.1	0.1	0.1	0.1	-	0.5
	2024	-	0.1	0.1	0.1	0.1	0.1	0.5
Specific Projects	2023	7.9	1.1	0.8	0.8	0.8	-	11.5
	2024	-	2.7	2.2	1.5	2.4	3.4	12.2
Total	2023	8.0	1.2	0.9	0.9	0.9	-	11.9
	2024	-	2.8	2.3	1.6	2.5	3.5	12.7

There are no specific projects in this category estimated to have a spending of more than $1 million in any fiscal year.

3. B. Damage/Failure

Damage/Failure projects are required to replace equipment and restore the electric system to its original configuration and capability following a damage or failure incident. Damage may be caused by storms, vehicle accidents, vandalism, or other unplanned events. Damage/Failure spending is typically mandatory work that is non-discretionary in terms of scope and timing.

The Damage/Failure investment level for the sub-transmission system is primarily based on historical costs for such work. Where condition renders an asset unable to perform its intended electrical or mechanical function on the delivery system, the Company initiates the timely replacement of such assets under the Damage/Failure spending rationale.

2023 to 2024 Variance:
The variance between the 2023 and 2024 Plans, shown in Table 3-3, is based on updating historical spending to include recent fiscal years.

Table 3-3
Damage Failure Spending Rationale Variance Summary ($Millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	3.5	3.6	3.7	3.8	4.1	-	18.8
2024	-	4.3	4.3	4.8	4.6	4.3	22.4

There are no specific projects in this category estimated to have a spending of more than $1 million in any fiscal year.

3. C. System Capacity

The projected investment for sub-transmission work in the System Capacity spending rationale over the Plan period is shown in Table 3-4 below.

2023 to 2024 Variance:
The projected program investment is based on the specific projects discussed in the Load Relief portion of this chapter. Comparison of the overall spend in sub-transmission between the 2023 and 2024 Plans is shown in Table 3-4.

Table 3-4
System Capacity Spending Rationale Variance Summary ($Millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	1.2	4.2	11.5	25.0	-	42.2
2024	-	0.8	15.6	17.3	38.2	37.5	109.4

Load Relief

Drivers:
An annual review of the sub-transmission system, including substation and circuit loading, is performed to review equipment utilization. The reviews consider both normal equipment loading and Load at Risk following an N-1 contingency. Forecasted load additions are applied to historical data, and the system is analyzed to determine where and when constraints are expected to develop. Recommendations for system reconfiguration or system infrastructure development are created as part of this annual review to ensure load can be served during peak demand periods and is documented in the Annual Capacity Plan.

The normal loading assessment identifies load relief plans for facilities that are projected to exceed 100% of normal capability (*i.e.*, maximum peak-loading allowed, assuming no system contingencies). Projects created as a result of the review are intended to be in-service within the year the violation is identified. N-1 reviews are conducted as well to identify facilities that are anticipated to exceed emergency ratings. Over the next ten years, load growth is expected to increase on an average of 0.4% per year after weather normalization to the 90/10 forecast. The forecast incorporates anticipated effects on demand due to solar, battery energy storage systems, electric vehicles, electric heat pumps, and energy efficiency investments. Incremental funding particularly in the latter part of the plan is driven by capacity needs of electrification (i.e., electric vehicles and electric heat pumps).

Customer Benefits:
The benefit to customers of completing the work identified in capacity planning studies is less exposure to service interruptions due to overloaded cables and transformers.

The majority of projects resulting from these studies are typically classified as Load Relief. Though a project is classified in one program such as Load Relief, it may have multiple drivers including reliability.

2023 to 2024 Variance:
The projected investment in this program is shown below. The variation year-on-year is due to the scope and timing of specific projects. In addition, station-related sub-transmission capacity improvements are discussed in Chapter 2 due to their FERC classification. Many of the projects in the Sub-transmission Asset Replacement and Overhead Line programs have multiple drivers and provide load relief and reliability improvements. A comparison of Load Relief spending between the 2023 and 2024 Plans is shown in Table 3-5, below.

Table 3-5
Load Relief Program Variance Summary ($Millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	1.2	4.2	11.5	25.0	-	42.2
2024	-	0.8	15.6	17.3	38.2	37.5	109.4

The following specific projects have forecasted spending that exceeds $1 million in any fiscal year:

- **New Buffalo Terminal Station 23KV Sub-T (C089020)** – This project will support the Katherine Street 115/23 KV Terminal Station project. Approximately 4.6 miles of new 23kV duct bank will be installed for 12 cables in Jefferson Ave (City of Buffalo) to supply six 23/4.16kV stations.
- **South Eden Greenfield Sub-T (C052023)** – This project will support the new South Eden 34.5/13.2kV Greenfield distribution station and involves the sub-transmission work that will be required to facilitate energization.
- **Modular Integrated Transportable Substation ("MITS") (C093716)** – This project is planned to support the existing loads at Niles and Jewett 34.5/13.2KV substations under the existing FY2037 forecast. Approximately one mile of new 13.2kV lines would need to be constructed, and a new MITS pad to be installed.

3. D. Asset Condition

Planned asset condition investment levels for the sub-transmission system are described below.

2023 to 2024 Variance:
The projected investments for asset condition driven projects are shown in Table 3-6 below and the variation year-on-year is due to the scope and timing of individual projects.

Table 3-6
Asset Condition Spending Rationale Variance Summary ($Millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	30.0	43.5	60.7	60.0	39.0	-	233.2
2024	-	27.3	56.5	58.9	54.5	55.1	252.1

Inspection and Maintenance
Under this program, the Company performs visual inspections on all overhead and underground sub-transmission assets once every five years. Each inspection identifies and categorizes all necessary repairs, or asset replacements, against a standard and in terms of criticality to maintain customer reliability in compliance with the Commission's Safety Order in Case 04-M-0159 ("Safety Order").[1]

In addition, the following types of inspections are conducted by the Company:
- Annual aerial assessments of sub-transmission lines, and
- Infrared inspections of sub-transmission lines on a three-year cycle.

[1] *Case 04-M-0159, Proceeding on Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems, Order Adopting Changes in the Electric Safety Standards (issued and effective Dec. 15, 2008, revised in March 2013) ("Safety Order").*

The Company also performs annual elevated voltage testing per the Safety Order on all facilities capable of conducting electricity that are publicly accessible.

Drivers:
The Company implements the Inspection and Maintenance ("I&M") program in accordance with the Safety Order and details its application in its Asset Condition Report.[2]

Customer Benefits:
This program is designed to ensure the Company fulfills its obligation to provide safe and reliable service through regular inspections of its facilities and timely repair of identified safety and reliability issues.

2023 to 2024 Variance:
Current investment forecasts are based on actual expenditures incurred under the I&M program, shown in Table 3-7, below.

Table 3-7
Inspection and Maintenance Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	8.0	7.5	7.5	7.5	9.0	-	39.5
2024	-	7.5	7.5	7.5	9.0	9.0	40.5

There are no specific projects in this category estimated to have a spending of more than $1 million in any fiscal year.

Overhead Line
Various projects are in-place to refurbish or replace sub-transmission overhead assets to ensure the system continues to perform in a safe and reliable manner. This includes pole, tower, overhead ground wire, and conductor replacement, in addition to work generated through the I&M program.

Drivers:
Although spending is categorized by spending rationale, all drivers are considered in determining the optimal project solution. Reliability and asset condition are the main drivers for these projects. Historically, the number of reliability events that are initiated on the sub-transmission system is low; however, these events can result in a substantial number of customers being interrupted where the lines are radial.

The physical condition of the sub-transmission system is assessed through the I&M program, helicopter surveys, engineering reviews, and "walk downs."

Customer Benefits:
Refurbishment and replacement of sub-transmission system components can positively impact regional CAIDI/SAIFI and Customer Minutes Interrupted ("CMI").

[2] *Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 17-E-0238, most recently filed on October 1, 2022.*

2023 to 2024 Variance:
The projected investment is shown in Table 3-8. Existing, identified work under this program will be continued. New projects are being identified on lines where work is required due to significant asset deterioration. The prioritization of these projects is continuously reviewed, and their schedules are updated accordingly.

Table 3-8
Overhead Line Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	9.2	20.5	32.9	21.1	15.6	-	99.3
2024	-	6.6	29.2	22.8	15.9	13.5	88.0

The following specific projects have forecasted spending that exceeds $1 million in any fiscal year:

- **Carthage – North Carthage – Deferiet, 23kV Refurbishment (C046435)** – Replace deteriorated Sub-T assets, such as, but not limited to, poles and insulators on the North Carthage - Carthage 24, North Carthage - Deferiet 29, Carthage - Herrings 28, & Herrings - Deferiet 27 circuits
- **Solvay/Woodard-Ash St 27&27&28- 34.5kV Refurbishment (C046439)** – Replace 69 structures on the Woodard – Ash 27 & the Solvay – Ash 28 circuits.
- **Lighthouse Hill – Mallory 22, 34.5kV Refurbishment (C046441)** – Replace 210 structures on the Lighthouse Hill – Mallory 22 circuit
- **Queensbury – Henry Street 14, 34.5kV Refurbishment (C046442)** – Replace 103 structures, including 85 with Chemonite treated poles to deter woodpecker damage, on the Queensbury – Henry Street 14 circuit
- **Yahnundasis – Clinton 24, 46kV Refurbishment (C046449)** – Replace 69 structures, including 45 with Chemonite treated poles to deter woodpecker damage, on the Yahnundasis – Clinton 24 circuit Additionally, remove the de-energized Yahnundasis – Clinton 24; Westmoreland Tap
- **Tonawanda Lines 601-604, 23kV Refurbishment (C046451)** – Replace insulators, Overhead Ground Wire, and Aerial Cable on the Tonawanda 601, 602, 603, & 604 circuits
- **Tonawanda Lines 622-624, 23kV Refurbishment (C046452)** – Replace 11 structures, Overhead Ground Wire, and Aerial Cable on the Tonawanda 622, 623, & 624 circuits
- **Deerfield – Whitesboro 26, 46kV Refurbishment (C046459)** – Replace 33 structures and 0.96 miles of Overhead Ground Wire on the Deerfield – Whitesboro 26 circuit
- **Woodard 29, 34.5kV Refurbishment (C046473)** – Replace deteriorated Sub-T assets, such as, but not limited to, poles and insulators on the Woodard 29 circuit
- **Shaleton-Ridge 610 Station 207 Tap (C046779)** – Replace 9 steel tower structures with 13 wood pole structures on the Shaleton-Ridge 610; Station 207 Tap.
- **Willowdale Tap 26H 33H 34H Refurbishment (C048911)** – Replace deteriorated Sub-T assets, such as, but not limited to, poles and insulators on the 26H, 33H, & 34H circuits
- **Kenmore – Winspear 630 & 631 Refurbishment (C050318)** – Replace one structure and reconductor 0.6 miles of aerial cable on the Kenmore – Winspear 630 & 631 circuits.
- **Union – Ausable Forks 36, 46kV Refurbishment (C050320)** – Replace 56 structures and reconductor 0.48 miles of conductor on the Union – Ausable Forks 36 circuit
- **Union – Lake Clear 35, 46kV Refurbishment (C050324)** – Replace deteriorated Sub-T assets, such as, but not limited to, poles and insulators on the Union – Lake Clear 35 circuit

- **Homer Hill – Nile 811, 34.5kV – Line Refurbishment (C050326)** – Replace 94 structures and reconductor 4.77 miles of #1 Copper conductor on the Homer Hill – Nile 811 circuit
- **Elbridge – Jewett 31, 34.5kV Refurbishment (C050959)** – Replace deteriorated Sub-T assets, such as, but not limited to, poles and insulators on the Elbridge – Jewett 31 circuit
- **Barker – Lyndonville 301, 34.5kV Refurbishment (C052511)** – Replace 184 structures including forty-six Chemonite treated poles to deter woodpecker damage on the Barker – Lyndonville section of the Phillips – Medina 301 circuit
- **Trenton – Whitesboro 25, 46kV Refurbishment (C058579)** – Replace deteriorated Sub-T assets, such as, but not limited to, poles and insulators on the Trenton – Whitesboro 25 circuit
- **Tonawanda 601-604, 23kV – Tower 22 & 23 Refurbishment (C067266)** – Replace Str# 22 & 23 on the Tonawanda 601, 602, 603, & 604 circuits
- **Gardenville – Dunkirk 141-142 Sub-T Line Relocation (C078197)** – Relocating the Ridge – Shaleton 610 circuit to support the Gardenville – Dunkirk 141 & 142, 115kV refurbishment project
- **W. Milton Tap 34.5kV New Line (CD00898)** – Building a new 34.5kV circuit between Rock City Falls and West Milton and retire the Ballston – Randall Rd 9 circuit

Underground Cable

The strategy for the asset management of Sub-Transmission underground cable is proactive replacement. Sub-transmission cable replacements will be completed through a series of specific projects targeting cables based on their past performance, history of failures, asset age, cable construction, design deficiencies, loading, and critical customers served.

City of Buffalo in Western, NY

The Sub-Transmission system in the City of Buffalo consists of 23kV cables that directly serve customer loads and supplies the City's distribution system. Construction of the City's existing distribution system began in the 1920s and is supplied by four terminal stations: Sawyer, Seneca, Kensington and Elm Street. The 23kV cable system represents approximately 433 miles of underground cables and supplies over forty 4.16kV distribution substations. Approximately 385 miles (about 620.8 km) of the original 1-3/C-350kcmil CU PILC (paper in lead-covered cable) installed in the late 1930s are still in service. These aging cables continue to experience mechanical stress due to annual loading cycles.

Eastern, NY and Central, NY

The underground Sub-Transmission systems in Eastern and Central, NY consist mainly of 34.5kV cables that directly serve customer loads and supply distribution systems that include 4.16kV substations that were prevalent prior to 115kV Transmission systems and 13.2kV Distribution systems.

Drivers:

Though failures of individual, underground sub-transmission cables typically do not impact customer reliability as they are generally networked, they can be difficult to locate and time-consuming to repair.

The sub-transmission underground cable asset replacement program replaces cables that are in poor condition, have a history of failure, or are of a type known to have performance issues.

Customer Benefits:

Cable replacement projects reduce the likelihood of in-service cable failures that increase exposure to extended outages.

2023 to 2024 Variance:
The projected program investment is shown in Table 3-9. The variation year-on-year is due to the scope and timing of specific projects and load growth in the area.

Table 3-9
Underground Cable Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.8	2.0	0.5	1.0	0.1	-	5.3
2024	-	2.9	0.5	1.0	0.0	0.0	4.4

There are no specific projects in this category estimated to have a spending of more than $1 million in any fiscal year.

3. E. Multi-Value Distribution (MVD)

Multi-Value Distribution:

Multi-Value Distribution ("MVD") projects combine proactive asset replacements driven by poor condition with an expanded scope to increase system capacity where appropriate. MVD Projects provide benefits to system capacity. Historically, Multi-Value Distribution projects were captured under the Asset Condition spending Rationale. In 2023, National Grid recognized the importance of highlighting Multi-Value Distribution as its own category with two core concepts: Asset Condition and capacity increase. The projects detailed below have a primary driver to replace structures on the sub-transmission system due to poor condition with a secondary driver to replace small conductor with larger conductor to proactively increase system or hosting capacity.

2023 to 2024 Variance:
The variances between the 2023 and 2024 Plans shown in the table below, as well as variances in the scope and timing of specific projects in this category, are described below. The Multi-Value Distribution spending rationale is new therefore the variance will be the total amount shifted from the Asset Condition rationale with increased scope.

Table 3-10
Multi-Value Distribution (MVD) Spending Rationale Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	3.0	10.8	18.0	19.6	26.3	77.7

MVD System Capacity
The MVD system capacity strategy includes those projects where major line refurbishments have been identified coupled with reconductoring from small ampacity wire to higher ampacity wire. These projects encompass replacing structures identified to be in poor condition, reconductoring of small wire, and potential relocation of back lot sections.

Drivers:
The investments in this strategy are driven by the need to address The Company's increasingly aging and obsolete infrastructure and meet the ever-increasing customer electrification and decarbonization demands to ensure safe and reliable network operation.

Customer Benefits:
The MVD System Capacity strategy can maximize the utilization of existing asset condition projects and planned system capacity needs while avoiding the cost of over-built or otherwise inefficient solutions which only address a single asset condition issue.

2023 to 2024 Variance:
The projected program investment is shown in Table 3-11. The variation year-on-year is due to scope and timing of specific projects in this category. The Multi-Value Distribution – System Capacity program name is new; therefore, the variance will be the total amount shifted from the various programs in the asset condition rationale with increased scope.

Table 3-11
Multi-Value Distribution (MVD) System Capacity Spending Rationale Variance Summary
($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	3.0	10.8	18.0	19.6	26.3	77.7

The following specific projects have forecasted spending that exceeds $1 million in any fiscal year:

- **Sherman-Ashville 863 (C079096)** – Replace 168 structures and reconductor 3.6 miles of #2 Copper conductor.
- **Phillips-Barker 301-34.5kV (C046465)** – Replace 200 structures and reconductor 7.1 miles of #2 Copper conductor.
- **Phillips-Telegraph 304-34.5kV (C046466)** – Replace 217 structure replacements, 6 lightning arrestors replacements, 6 cross-arm replacements, 18 gauge wire repairs, and reconductor 8.9 miles of #1 & #2 Copper conductor.
- **Dake Hill-W. Salamanca 816-34.5kV (C046469)** – Replace 135 structures and reconductor 1.7 miles of #1 Copper conductor.
- **Bristol Hill-Phoenix 23-34.5kV (C046474)** – Replace 103 structures and reconductor 0.13 miles of #8 Copper conductor.
- **Bagdad-Dake Hill 815-34.5kV Refurbishment (C050292)** – Replace 118 structures, changeout insulators at 3 locations, reconductor approximately 8 miles of #1 Copper conductor.
- **Nile-S. Wellsville 812-34.5kV Refurbishment (C051765)** – Address any and all safety concerns due to deterioration of assets and momentary outages. It is assumed that approximately 111 structures will need to be replaced and reconductoring of about 14 miles of #2 Copper conductor
- **Waterport Tap 301-34.5kV (C052515)** – Replace 72 structures, 7 crossarms, and approximately 0.5 miles of #2 Copperweld conductor.
- **Manheim 46kV Relocation (C074485)** – This project supports the Inghams Revitalization Project by connecting the existing 46kV lines to the relocated substation, including the Valley-Inghams #26, the Valley-Inghams #27, and a tap to the Brookfield Power Generating station located at the site of the original Inghams substation.
- **Buffalo 23kV Reconductor – Huntley (C079450)** – Replace Cable 11H from Sawyer Station to Station 52, along with targeted sections of cables 10, 12, 14 and 15H. Project is for the replacement of 18,000 circuit feet of cable 11H from Sawyer Transmission Station to Station 52 with 500 kcmil Cu. The cables run mainly along Kenmore Ave and

Elmwood Ave. The project also provides for the replacement of another 15,000 circuit feet of cable to replace portions of the remaining length of 11H and the four other cables 10H, 12H, 14H, and 15H.

- **Franklinville – Sub-T Work (C093618)** – This project supports new taps to a new substation that is to be built in this location. The sub-transmission taps location will be off of the Machias-Maplehurst No 802 Line (34.5kV).
- **Minoa D-Line (C093707)** – Asset condition age of equipment and system capacity due to forecasted loading exceeding 95%SN in 2036.
- **Warrensburg-Chestertown 6 Reconductor OH (C093770)** – Reconductor approximately 1 mile of 4/0 AL OH conductor due to forecasted load growth on 34.5kV system north of Warrensburg substation which is expected to overload the line by 2040.

3. F. Reliability

Reliability

Reliability projects are required to ensure the electric network has sufficient operability to meet the demands of the system and our customers. Projects in this spending rationale are intended to improve performance of facilities where design standards have changed over time and to provide appropriate degrees of system configuration flexibility to limit adverse reliability impacts of contingencies.

The Company has instituted planning criteria for Customers Interrupted ("CI") and Customer Hours Interrupted ("CHI") at Risk following an N-1 contingency that sets CI and CHI exposure thresholds for various supply and feeder contingencies for the purpose of setting a standard for minimum electrical system performance. These thresholds are applied in conjunction with other criteria—such as maintaining acceptable delivery voltage and observing equipment capacity ratings—to ensure the system operates in a reliable manner while managing risk of customer interruptions to an acceptable level.

Analysis of the interruptions under these criteria assume that all practical means are used to return load to service, including use of mobile transformers and field switching via other area supply lines and/or area feeder ties. CHI analysis recognizes the approximate times required to install mobile/back-up equipment as well as stepped field switching, such as moving load from the adjoining in-service station with feeder ties, that will be used to pick-up customers experiencing an interruption, to a second adjoining station to increase the capability of the feeder ties.

The projected investment for sub-transmission work in the Reliability spending rationale over the Plan period is shown in Table 3-10 below.

2023 to 2024 Variance:

The variances between the 2023 and 2024 Plans are shown in Table 3-12.

Table 3-12
Reliability Spending Rationale Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.2	3.4	2.0	3.5	0.8	-	11.0
2024	-	1.6	3.9	2.2	13.0	8.8	29.6

The following specific projects classified as Reliability are estimated to have spending more than $1 million in any fiscal year:

- **LN863 Findley Lake – French Creek (C046510)** – The customer requested service supply be transferred from distribution to sub-transmission. It is recommended the sub-transmission loop between Findley Lake and French Creek substations be closed. This project extends line 863 between Findley Lake and French Creek substations to create the closed loop.
- **Union Falls Flood Mitigation Sub-T (C068247)** – Union Falls substation resides in the Northern region. Due to its proximity to the Saranac River, the substation is located in a designated, high-risk flood zone per Federal Emergency Management Agency ("FEMA"), thus placing the station equipment at risk.
- **Ludwig – Gardenville 704 34.5kV Relocation (C085043)** – Rebuild the 34.5kV 704 Line from Structure 532 to Gardenville Substation. The 704 Line will be removed from double circuit towers with the 180 Line and be relocated to independent single circuit structures to facilitate the bussing of the 180 Line as part of a separate project.
- **Boonville-Raquette Lake Fiber (C090818)** - Communications are needed for the protection scheme at Raquette Lake for the new battery storage planned for installation.

3. G. Resiliency

Resiliency:
Resiliency projects are intended to ensure the electric power system has the ability to recover quickly following a large-scale interruption or, more generally, the ability of anticipating extraordinary and high-impact, low-probability events and rapidly recovering from these disruptive events.

System recovery refers to the use of tools and techniques to quickly restore service to as many affected customers as practical.

Survivability refers to the enhanced system planning or use of innovative technologies to aid customers, communities, and institutions in continuing some level of normal function without limited access to the grid. The main program within this rationale is Sub-Transmission Automation. Sub-Transmission Automation is a method of systematically installing devices upon the sub-transmission system which will reduce the total number of customers interrupted for an extended period from a disruptive event. A new program under Sub-Transmission is Climate Vulnerability. The projects under this program are a result of the Climate Change Vulnerability Study ("CCVS") and Resilience Plan ("CCRP") to prepare Sub-Transmission assets to adapt to projected increased intensity and frequency of climate hazards.

2023 to 2024 Variance:
The variances between the 2023 and 2024 Plans are shown in Table 3-13, below.

Table 3-13
Resiliency Spending Rationale Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	5.4	7.3	24.0	25.0	28.5	-	90.2
2024	-	6.2	25.5	28.0	31.5	17.9	108.5

Sub-Transmission Automation

The Sub-Transmission Automation Strategy includes advanced distribution automation methodologies as well as SCADA connectivity for reclosers, fault locators, and switches and the interface of distribution automation-enabled line devices with substation feeder breakers. It also encompasses the communication of these devices to a centralized control for Fault Location, Isolation, and Service Restoration ("FLISR") capability, control center operations, and database warehouses.

Drivers:

The installation of modernized switching schemes and FLISR will provide increased reliability and resiliency to the sub-transmission system. The number of switches per circuit or installation will vary depending on the number of substations a circuit supplies, the desired segmentation of the line, and the configuration of the supply system. Many of the automation schemes are unique and are developed considering an analysis of expected costs and benefits.

Customer Benefits:

Distribution lines or substations not equipped with automated sectionalizing or throw over schemes may be subject to extended service interruptions as operations personnel must travel to the field locations to perform switching. This program provides an opportunity to continue to modernize the grid to the benefit of customers by reducing the number of customer interruptions that result from a given contingency and the time required to reconfigure the system to restore service to as many customers as possible while a faulted section of the system is being repaired.

2023 to 2024 Variance:

The projected investment is shown in Table 3-14. National Grid is ramping up deployment of Sub-Transmission Automation (i.e., FLISR) and expects to continue statewide deployment on selected circuits after an acceleration effort in the areas of reliability and resiliency.

Table 3-14
Sub-T Automation Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	5.4	7.2	23.5	25.0	28.5	-	89.6
2024	-	5.6	23.5	25.0	28.5	14.8	97.4

The following programs are classified as Sub-Transmission Automation and have planned spending more than $1 million in any fiscal year:

- **Sub-Transmission Automation Program (C089150 - NYE, C090712 - NYC, C084935 - NYW)** – These projects cover deployment of automation schemes (such as FLISR) which will improve reliability and resiliency by reducing both customers impacted by contingencies and restoration times for unaffected customers via automated switching schemes. These project supports CLCPA initiatives.

Climate Vulnerability

In 2023, the Company completed a Climate Change Vulnerability Study (CCVS) and Climate Change Resiliency Plan (CCRP) to understand the impact future climate hazard projections would have on transmission and distribution assets and design standards and how to adapt to the impacts of climate change. The priority climate hazards identified for sub-transmission assets were wind and ice. The projects below were chosen to upgrade assets and better withstand increased intensity and frequency extreme weather events.

Drivers:
As a result of the CCVS and CCRP, the below projects were recommended due to a projected increase in frequency and intensity of climate hazards across the sub-transmission system. From the Study and Plan, it was determined that sub-transmission assets should withstand more than the required National Electrical Safety Code ("NESC") weather loading of 0.5 inches of icing and 40 mph wind gusts. This is based on the wind and radial icing data from a study that was completed with Massachusetts Institute of Technology ("MIT").

Customer Benefits:
These projects will strengthen sub-transmission structures and assets to be able to withstand more intense weather events, such as wind and radial icing.

2023 to 2024 Variance:
These projects were not in the 2023 Plan.

Table 3-15
Climate Vulnerability ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	0.0	1.4	3.0	3.0	3.1	10.5

The following programs have forecasted spending that exceeds $1 million in any fiscal year:

- **Sub-T CCRP Projects (C094135 - NYE, C094136 - NYC, C094134 - NYW)** – To better maintain resilience during wind and icing events, future pole additions or replacements will use larger Class 1 poles for single circuit structures, Class H1 for double circuit structures, and Class H2 for double circuit structures with distribution underbuilt or multiple third-party attachments. Approximately 900 sub-transmission structures will be affected by this design standard upgrade annually.

3. H. Communications / Control Systems

There are no Communications/Control Systems project costs currently expected for the sub-transmission system.

3. I. DER – Electric System Access

The Distributed Energy Resources ("DER") Electric System Access rationale is used to capture work where the Company will be supporting items such as DG interconnections, storage, NWA, and other third-party and market-driven needs. Distributed generation interconnections generally are reimbursable and therefore have little effect on net program spending. This spending rationale also includes projects that are non-reimbursable by the customer, such as farm digester projects; however, no such project is included in the plan horizon.

Drivers:
DER Interconnection and deployment of both third party and company owned assets is the main driver of projects under this program. The Company considers storage projects as non-wires alternatives, or as direct solutions where there is no feasible 'wires alternative'. Storage projects

also advance the Company's strategy to support the State's CLCPA goals. The Company seeks to gain more experience in operation, coordination, and dispatch of energy storage facilities to support safe and reliable electric distribution system operation. DER assets, such as storage, can be used to meet planning needs such as system capacity, reliability, and ancillary grid services. For example, the North Lakeville Energy Storage Project is scoped to provide voltage support during contingency, where the alternative solution would be to construct a new transmission line and subsequent station upgrade work. The traditional alternative is seen to be a costly upgrade compared to a DER approach; therefore, a Battery Energy Storage System ("BESS") has been proposed to meet the need.

Customer Benefits:
This program animates the energy storage market through attracting storage developers and suppliers to bid on opportunities identified by the Company where storage could provide significant local and system-wide benefits, such as deferral of system capacity upgrades, improved system reliability, and system-wide peak load reduction. Additionally, the storage will provide benefits to customers either in the form of direct resiliency improvement or through deferral of a 'wires' alternative.

2023 to 2024 Variance:
The projected investment is shown in Table 3-16 below. The forecast has increased from 2023 primarily due to projects for Utility Owned Storage.

Table 3-16
DER Electric System Access Spending Rationale Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.1	0.5	9.0	36.0	45.6

Table 3-17
Company Owned DER ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	0.0	0.0	0.0	-	0.0
2024	-	0.0	0.1	0.5	9.0	36.0	45.6

The following specific projects have forecasted spending that exceeds $1 million in any fiscal year:

- **Akwesasne Line 26 Energy Storage (C093829)** – The Akwesasne - Ft Covington Station Line 26 is subject to low voltage constraints during N-1 contingency. This project is to construct an energy storage asset in order to support voltage constraints during normal and contingency operation.
- **North Lakeville L218 Energy Storage (C093807)** – The North Lakeville Station and subsequent radial sub-transmission lines are subject to low voltage constraints during N-1 contingency and expected to be constrained during normal operation with increased load forecasts. This project is to construct an energy storage asset in order to support voltage constraints during normal and contingency operation.
- **Sherman L863 Energy Storage (C093833)** – The Sherman Station and 863 sub-transmission line that supply Sherman Station are subject to low voltage constraints during

N-1 contingency. This project is to construct an energy storage asset in order to support voltage constraints during normal and contingency operation.

3. J. Non-Infrastructure

There are no Non-Infrastructure project costs currently expected for the sub-transmission system.

Chapter 4: Distribution System

The Company's distribution system consists of lines and substations typically operating at 15kV and below. There are over 36,600 circuit miles of overhead primary wire and over 7,900 circuit miles of underground ("UG") primary cable on the system supplying approximately 421,000 overhead ("OH"), padmount and underground distribution transformers. Additionally, there are 526 substations providing service to the Company's over 1.67 million electric customers. To serve the needs of customers over the five-year period covered by this Plan, the Company expects to invest approximately $4,828.4 million on the distribution system, as shown in Table 4-1 below.

Table 4-1
Distribution System Capital Expenditure by Spending Rationale ($ millions)

Spending Rationale	FY25	FY26	FY27	FY28	FY29	Total
Customer Request/Public Requirement	284.4	339.4	236.9	247.6	259.3	1,367.6
Damage/Failure	115.2	126.7	118.8	131.6	138.9	631.1
System Capacity – NY	29.9	64.7	99.9	157.6	141.1	493.2
Asset Condition	78.6	118.0	139.4	158.1	152.3	646.3
Multi-Value Distribution (MVD)	64.7	84.7	101.4	115.8	96.8	463.5
Reliability	46.0	47.7	46.0	48.1	35.4	223.2
Resiliency	21.2	84.9	99.9	186.2	195.6	587.8
Communications/ Control Systems	36.4	47.3	51.0	57.6	62.3	254.6
DER Electric System Access	0.0	0.0	0.0	0.0	1.1	1.1
Non-Infrastructure	4.4	4.5	4.6	4.8	4.9	23.2
Local Spending Total	**680.8**	**918.1**	**898.0**	**1,107.3**	**1,087.6**	**4,691.8**
EV MRP	4.5	5.7	8.8	10.9	12.0	41.9
Cost Share 2.0	0.0	22.5	22.5	22.5	22.5	90.0
Local Supplemental Spending Total	**4.5**	**28.2**	**31.3**	**33.4**	**34.5**	**131.9**
CLCPA Ph2A	1.0	2.5	0.0	1.2	0.0	4.7
Regional Spending Total	**1.0**	**2.5**	**0.0**	**1.2**	**0.0**	**4.7**
Grand Total	**686.3**	**948.7**	**929.3**	**1,142.0**	**1,122.1**	**4,828.4**

4. A. Customer Requests/Public Requirements

Distribution Customer Requests/Public Requirements projects include capital expenditures for new business residential, new business commercial, outdoor lighting, and third-party attachments, among other things. Customer Requests/Public Requirements investment levels are

based primarily on review of historical blanket spending and forecasted spending on known specific work. These estimates reflect consideration of inflation, estimates of materials, labor, indirect cost, market sector analysis, overall economic conditions, and historical activity. In addition, the Electric Vehicle ("EV") Make Ready Program ("MRP") and the AMI program investments (described below) are reflected in this year's Plan. The projected investment is shown in Table 4-2 below.

Table 4-2
Customer Request / Public Requirement Spending Rationale Variance Summary ($ millions)

	CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
Blankets	2023	95.4	98.3	101.3	104.4	111.7	-	511.0
	2024	-	161.3	184.1	190.5	205.9	214.4	956.2
Specific/Reserve	2023	89.2	141.1	140.3	50.3	34.7	-	455.6
	2024	-	127.7	161.0	55.2	52.7	56.8	453.4
Total	**2023**	**184.6**	**239.4**	**241.6**	**154.7**	**146.3**	**-**	**966.6**
	2024	**-**	**288.9**	**345.1**	**245.7**	**258.6**	**271.3**	**1,409.6[1]**

Blankets:

The distribution Customer Requests/Public Requirements blankets include items such as Transformer Purchase and Installation, New Business Residential, New Business Commercial, Outdoor Street Lighting, Public Requirements, Meter Purchase and Installation, Third Party Attachments, and Land Rights. Exhibit 3 shows the detailed investment for all blankets in this rationale. Blankets are described in more detail below.

Transformer Purchase
Transformers are purchased and shipped to Company locations where they are put into inventory stores. These investments are broken out below to specifically show the inflationary pressure and supply chain constraints for distribution service transformer assets. Due to rapid increases in load forecasts and heightened asset costs these pre-capitalized transformer investments have increased by over $50M year over year.

Only by leveraging structured procurement contracts are we able to reliably secure assets for their respective storerooms within the confines of their forecasted demand schedules.

Table 4-3
Transformer Purchase Investment Plan ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	40.0	41.2	42.4	43.7	47.3	-	214.6
2024	-	90.0	104.1	106.2	108.5	110.8	519.6

New Business Residential
The New Business Residential category includes installation of new overhead or underground services to residential customers, reconnections, and miscellaneous equipment related to providing or upgrading services based on customer requests. Project spending can also include

[1] *This total includes the EV MRP Local Supplemental spending which utilizes a different recovery mechanism from the investments to be filed in the upcoming NIMO rate filing.*

costs for the extension of distribution feeders directly related to providing service to a new residential customer or development. Actual spending is net of any contribution in aid of construction ("CIAC").

New Business Commercial
New Business Commercial includes installation of new services to commercial customers, reconnections, and miscellaneous equipment related to providing or upgrading services based on customer requests. Project spending can also include costs for the extension of distribution feeders directly related to providing service to a new commercial or industrial customer or development. Actual spending is net of any CIAC.

Meter Purchase
Meters are purchased and shipped to Company locations where they are put into stores.

Meter Installation
Meters are installed or replaced at customer metering points to maintain equipment compatibility and readout accuracy.

Outdoor Street Lighting
Street lighting or private area lighting ("PAL") and related equipment is installed or replaced.

Public Requirements
Public Requirements include overhead and underground facility relocations resulting from bridge or roadway rebuilds, expansions, relocations, municipal requests to relocate overhead facilities underground, and other public authorities' requests or work that requires equipment or facilities to be relocated.

Third Party Attachments
Third Party Attachments includes rework or installation of facilities on poles to fit new or 3rd party attachments or cable company requests.

Land and Land Rights
This funding supports the purchase of land and land rights.

Specific Projects:

Below are the forecasted specific projects with planned spending in excess of $1 million in any fiscal year.

LED Investment Plan
The following programs for converting streetlights to light-emitting diode ("LED") technology are classified as New Business Commercial and are forecasted with planned spending in excess of $1 million in any fiscal year.

- **New LED East NY (C069947)**
- **New LED Central NY (C069886)**
- **New LED West NY (C069927)**

Table 4-4
LED Investment Plan ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	6.0	6.0	7.6	7.0	7.0	-	33.5
2024	-	6.0	7.6	7.0	7.0	4.5	32.0

EV MRP
The following programs for costs associated with utility side of the meter upgrades for EV MRP customers interconnecting to the electric system are classified as New Business Commercial and are forecasted with planned spending in excess of $1 million in any fiscal year.

- **Electric Transport Initiative – FTM NYE (C085240)**
- **Electric Transport Initiative – FTM NYC (C086719)**
- **Electric Transport Initiative – FTM NYW (C086718)**

Table 4-5
EV MRP Investment Plan ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	5.8	7.7	5.7	8.8	10.9	-	38.9
2024	-	4.5	5.7	8.8	10.9	12.0	41.9

Advanced Metering Infrastructure ("AMI")
The PSC approved the Company's AMI proposal on November 20, 2020, with modifications that included adjusting the BCA to reflect "opt-in" time-varying pricing ("TVP") assumptions, enhanced data latency, and a cap on capital investments at $475.2M the first sixyears.[2]

Drivers:
AMI implementation will position the Company to develop and deploy solutions aimed at achieving the State's clean energy policy goals. Among other benefits, AMI will support grid modernization and distributed system platform ("DSP") planning functions, including demand modeling, load forecasting, hosting capacity analysis, and capital investment planning. AMI will also enable TVP rate designs necessary to support DER valuation, new innovative services, and distribution system efficiency. The Company's customers expect, and the Company is committed to delivering, continuously expanding services and benefits that AMI can provide.
When AMI meters are deployed, and the associated back-office infrastructure is in-place, customers will have access to more granular usage data in near real-time. The frequency of the readings, combined with the granularity of data, will enable customers to control their energy usage through energy efficiency, conservation, demand response, and new pricing programs. AMI will allow customers to monitor their energy consumption and better manage their energy bills.

Customer Benefits:
In addition to the foregoing, AMI implementation can also support the following advances:

[2] *Case 17-E-0238, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service, Order Authorizing Implementation of Advanced Metering Infrastructure with Modifications (issued and effective Nov. 20, 2020).*

Innovative Rate Design Options:
AMI lays the foundation for innovative rate design structures that can reward customers for optimizing their energy usage (*e.g.*, time-of-use rates, critical peak pricing programs, and "Smart Home" rates). AMI meters, unlike the current automated meter reading ("AMR") meters, can also be programmed over the air, avoiding the costly manual rate programming that could be required with AMR technologies.

Enablement of Smart Home Devices:
AMI will enable customers to manage their energy consumption through use of smart home devices such as thermostats, water heaters, and other appliances that can be integrated with AMI to automatically adjust energy consumption in response to pricing signals and calls for curtailment. Home energy management systems will be able to send and receive secure communications from the Company or third-party market entities.

Outage Management:
AMI can enhance outage notifications through autonomous alerts. AMI functionality also allows the Company to send a signal to AMI meters to identify areas that still require restoration and confirm when all outages have been restored. This functionality will improve situational awareness contributing to reduced restoration costs and improved outage response.

Customer Service Enhancements:
AMI data can be used by call center representatives to enhance customer interactions. For example, AMI will:

- Allow call center representatives to send a signal to the meter to determine voltage levels or whether an outage is due to customer-owned equipment.
- Allow for real-time reconnects of electric meters.
- Provide historic information about prior outages and voltages.
- Provide additional rate plans and options for customers seeking flexibility for their energy management needs.

AMI Field Area Networks ("FANs")
FAN communications equipment is an integral component of the entire AMI solution. The FAN collects and backhauls AMI meter data to the Company's billing system. The FAN is comprised of a series of communication equipment such as collectors and routers, RF Mesh network, and field networking equipment to collect and transmit meter data every 15 minutes as opposed to our current monthly AMR meter reads.

Drivers:
As the electric distribution system evolves with increased levels of Distributed Energy Resources ("DER") and loading, additional monitoring along distribution feeders will allow the Company to model the system more accurately. Increased power flow data can improve the accuracy of engineering studies to reduce inefficiencies and eliminate the need for modeling assumptions.

The AMI Field Area Network will utilize an RF Mesh network designed to enable two-way communication with the AMI meters. The communication network is necessary to enable AMI functionality. The intervals and frequency of the meter data, combined with grid edge data, will enable near real-time response and enhanced control of energy management through energy efficiency, conservation, demand response, and new pricing programs.

2023 to 2024 Variance:
The projected investment for the AMI project is shown in Table 4-6. Utilizing an agile project management framework and launching a small initial program for equipment testing and end-to-end creation of a customer's bill, a detailed design and back-office systems installation is scheduled to begin in FY22. The two-years of back-office work will be followed by a multi-year electric AMI meter, gas module, and communication network deployment. FAN deployment started in February 2023, with a soft launch in April 2023 and full deployment in August 2023. Project costs include the cost of the electric meters, FAN installation, and project management.

The projected variance from 2023 to 2024 CIP is due to a lower than expected asset deployment in 2023, shifting $5M capex into FY25. Overall, the program's total spending is within the approved allowance, with no anticipated delay in the program timeline.

Table 4-6
AMI program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	69.2	108.7	105.2	22.0	0.4	-	305.5
2024	-	113.9	105.2	22.0	0.4	0.0	241.5

The following programs are expected to exceed $1 million in any fiscal year:

- **AMI – NY Electric (C083340 - NYE, C087167 - NYC, C087168 - NYW)** – These projects are to install advanced meters across the Upstate New York service territory.
- **AMI Field Area Networks (FANs) (C084958 - NYE, C087157 - NYC, C087158 - NYW)** – These projects are to install communications for advanced meters in various locations across the service territory.

Other:
- **EV Highway[3] - Mobile Storage (C094583, C094584, C094585)**: Battery sites will be supporting the EV Highway service plazas at Angola, Guilderland, and Chittenango.
- **Distribution Middle Mile Make Ready (C093886, C093887):** This make ready work ensures that National Grid infrastructure supports the addition of fiber optic cable making sure that necessary clearances are maintained and pole loading resiliency is adequate.
- **I-81 Viaduct Project (C091451, C093519, C091245):** The State is tearing down a section of I-81 in Syracuse and rerouting highway traffic onto nearby Interstate 481. The plan also calls for rebuilding a portion of Interstate 690 near the current intersection with I-81. This work requires relocation of over 12,000 feet of duct line, forty-two manhole structures, and 50,000 circuit-feet. of distribution and sub-transmission cables, along with minor overhead distribution facilities.
- **Laselle Park Relocation (C086922):** Relocate UG feed, remove lead cable, and feed newly developed park.
- **Sonora Livonia Conversion (C093798):** Convert part of Livonia 4.8 kV 3763 feeder (estimated 0.65 miles) to 13.2 kV and feed from Sonora way Station.

Spend profile located in Exhibit 3.

[3] *For the associated Transmission EV Highway projects, refer to section 2.C. of this document. For the associated Distribution EV Highway projects, refer to section 4.C. of this document.*

4. B. Damage/Failure

Damage/Failure projects are required to replace equipment and restore the electric system to its original configuration and capability following a damage or failure incident.

Damage may be caused by storms, vehicle accidents, vandalism, or other unplanned events. Damage/Failure spending is typically mandatory work that is non-discretionary in terms of scope and timing.

The Damage/Failure investment level for the distribution system is primarily based on historical actual costs for such work. Where conditions render an asset unable to perform its intended electrical or mechanical function on the delivery system, the Company initiates the timely replacement of such asset under the Damage/Failure spending rationale.

2023 to 2024 Variance:
Comparison of the distribution Damage/Failure investment levels from the 2023 and 2024 Plans is set forth below.

Table 4-7
Damage/Failure Spending Rationale
Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	88.6	89.6	104.1	103.6	115.8	-	501.6
2024	-	115.2	126.7	118.8	131.6	138.9	631.1

The following specific projects are classified as Damage/Failure and have planned spending in excess of $1 million in any fiscal year. Details on the planned spending profiles for these projects are included in Exhibit 3.

- **Axa Equitible Towers Vault Rebuild (C093513)** - This project calls to rebuild the six vaults at the Axa Equitable Tower (formerly MONY Towers) Complex. This complex consists of the two towers, an underground parking garage, and the Syracuse Tech Garden. Currently, this location is being served by four transformers because the other two transformers failed.
- **DF-Station 205 - TRF3 Failure (C091523)** - This project replaces TRF3 at Station 205. TB3 is a 23.5/13.8kV (3.75/4.68MVA) transformer and this project is a one for one replacement.
- **DF-Station 54 - TRF2 Replacement (C091518)** - This project replaces TRF2 at Station 54. TRF2 is a 115/4.16kV (7.5/9.375MVA) transformer and this project is a one for one replacement.
- **DF- Riverside Sta 288 - TRF4 Failed (C091468)** - This project replaces TRF4 at Riverside Substation 288. TRF4 is a 115/34.5kV (75MVA) transformer and this project is a one for one replacement.
- **Hague Rd 53 - Submarine Cable (C050522)** - This project replaces the existing 6,400-foot, 5kV cable that crosses Lake George from Friends Point Dr. to Glen Bernie Rd. with a new 15kV cable capable of carrying a minimum of 350A. This cable provides the only feeder tie between the Hague Rd 52 and 53 feeders which is not at the substation.
- **NY Mobile 2E - Replacement (C086808)** - This purchases a new 110/67/33.5/23 - 13.8/4.36 mobile substation to replace the damaged 2E mobile substation.

4. C. System Capacity

System Capacity projects are required to ensure the electric network has sufficient capacity, resiliency, or operability to meet the growing and/or shifting demands of the system and our customers. Projects in this spending rationale are intended to reduce degradation of equipment service lives due to thermal stress and to improve facility performance where design standards have changed over time. In addition to accommodating load growth, the expenditures in this rationale support the installation of new equipment such as capacitor banks to maintain the requisite power quality required by customers. Volt-Var Optimization ("VVO") investments also are included in the System Capacity spending rationale. The projected distribution investment in the System Capacity spending rationale over the Plan period is shown in the table below.

2023 to 2024 Variance:
The variances between the 2023 and 2024 Plans are shown below. Table 4-8 reflects variation in the scope and timing of specific projects in this category. Variance in totals between the 2023 and 2024 CIP reflect a continued ramp-up of system capacity investments reflecting forecasted load growth throughout the state.

Table 4-8
System Capacity Spending Rationale
Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	28.8	28.6	125.0	134.8	221.1	-	538.3
2024	-	30.8	89.7	122.4	181.3	163.6	587.9[4]

Load Relief:

Drivers:
Reviews of the distribution system, including substation and feeder loading, are performed annually to assess equipment utilization. The reviews consider normal equipment loading to identify predicted violations. Forecasted load additions are applied to historical data, and the system is analyzed to determine where and when constraints are expected to develop. Recommendations for system reconfiguration or system infrastructure development are created as part of these annual reviews to ensure load can be served during peak demand periods and are documented in the Annual Capacity Plan.

The normal loading assessment identifies load relief plans for facilities that are projected to exceed 95% of normal capability (*i.e.*, maximum peak loading allowed assuming no system contingencies). Projects created as a result of the review are intended to be in-service during the year the violation is identified. Over the next ten years, peak load growth is expected to increase on an average of 2.53% per year after weather normalization to the 90/10 forecast. The forecast incorporates anticipated effects on demand due to solar, battery energy storage systems, electric vehicles, electric heat pumps, and energy efficiency investments. Incremental funding particularly in the latter part of the plan is driven by capacity needs of electrification (i.e., EVs and electric heat pumps).

[4] *This total includes the Cost Share 2.0 and CLCPA Ph1 and Ph2A spending. These projects have Local Supplemental and Regional spending categories*, which *utilize a different recovery mechanism from the investments to be filed in the upcoming NIMO rate filing.*

The Annual Capacity Plan reviews loading on over 2,000 feeders and more than 500 substations, resulting in numerous upgrade projects that range in scope from switching load between feeders and/or substations to new lines or substations.

Customer Benefits:
The benefit to customers of completing the work identified in capacity planning studies includes less exposure to service interruptions due to overloaded cables and transformers. The projects resulting from these studies are typically classified as Load Relief. Other program classifications are possible as a program could have multiple drivers.

2023 to 2024 Variance:
The projected investment is shown in the table below and variation year-on-year is due to the scope and timing of specific projects. Additionally, this year's inclusion of the Distribution Transformer Replacement Program increased this variance.

Table 4-9
Load Relief and Distribution Transformer Replacement Program Variance ($ millions)

	CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
Specific Projects	2023	26.6	26.4	122.7	132.5	218.6	-	526.8
	2024	-	29.1	85.3	117.0	175.9	157.7	564.9
Load Relief Blankets	2023	2.1	2.2	2.3	2.3	2.5	-	11.5
	2024	-	1.7	3.3	3.3	3.4	3.5	15.2
Total	**2023**	**28.8**	**28.6**	**125.0**	**134.8**	**221.1**	**-**	**538.3**
	2024	**-**	**30.8**	**88.5**	**120.3**	**179.3**	**161.2**	**580.1**

The following specific projects are classified as Load Relief and have planned spending more than $1 million in any fiscal year. Load Relief is the primary driver; however, each project can have additional drivers such as asset condition, reliability, resiliency, etc. Details on the planned spending profiles for these projects are included in Exhibit 3.

EV Highway[5]: The below projects are a part of a suite of projects to support EV charging at NYS Thruway travel plazas.

- **EV Highway – Pattersonville (C094393 and C094392)** - This Project is required to support the additional EV charging at the NYS Thruway travel plaza. This project will install a new distribution Substation with one 40MVA transformer, four open air feeder positions, and a new Control house will be installed. Additionally, this project installs a double circuit 13.2kV 477 MCM feeders from the new substation to the highway rest stop EV charging facilities. This includes boring under the highway and padmount equipment to step down to 480V.
- **EV RS – Chittenango (C094400 and C094401)** - These projects are required to support the additional EV charging at the NYS Thruway travel plaza. This includes the installation of a new distribution substation with one 40MVA transformer, four open air feeder positions, and a new Control house. Additionally, this requires the installation of a double circuit 13.2kV 477 MCM feeders from the new substation to the highway rest stop EV

[5] *For the associated Transmission EV Highway projects, refer to section 2.C. of this document. For the associated Mobile Storage EV Highway projects, refer to section 4.A. of this document.*

charging facilities. This includes boring under the highway and padmount equipment to step down to 480V.

- **EV RS – Dewitt (C094394 and C094396)** - These projects are required to support the additional EV charging at the NYS Thruway travel plaza. This includes the installation of a new distribution substation with one 40MVA transformer, four open air feeder positions, and a new Control house. Additionally, this requires the installation of a double circuit 13.2kV 477 MCM feeders from the new substation to the highway rest stop EV charging facilities. This includes boring under the highway and padmount equipment to step down to 480V.
- **EV RS - Pembroke (Flying J) (C094380 and C094387)** - These projects are required to support the additional EV charging at the off-thruway travel plaza. This includes the installation of a new distribution substation with one 40MVA transformer, four open air feeder positions, and a new Control house. Additionally, this requires the installation of underground 13.2kV feeders from the new substation to the highway rest stop EV charging facilities. This includes boring under the highway and padmount equipment to step down to 480V.
- **EV RS - Angola (C094390 and C094391)** – These projects are required to support the additional EV charging at the NYS Thruway Travel Plaza. This includes the installation of a new distribution substation with one 40MVA transformer, four open air feeder positions, and a new Control house. Additionally, this requires the installation of lines from the new substation to the highway rest stop EV charging facilities. This includes boring under the highway and padmount equipment to step down to 480V.

East:

- **Elsmere Substation Rebuild (C083916)** - This project provides for a station rebuild, a new station transformer, and new feeder getaways at Elsmere substation. In addition, this project will resolve loading issues and MWh criteria violations in the area.
- **Sodeman Rd 51 Feeder Construction (C076785)** - This project resolves a MWhr violation at Ballston Station for the loss of TB3 reducing it from 386 MWhrs to 78 MWhrs. It resolves a SN loading issue for Ballston TB3 which is projected to reach 101% of its SN rating in 2016. This allows for the retirement of the Rock City Falls station which is a 34.5kV supplied 4kV station. This project will also add much needed capacity to the area which has the potential for increased demand due to the building of the Luther Forest Plant.
- **Commerce Station (C091533)** - The project will increase the size of the transformer at Commerce Ave Station, in order to retire Russell Road substation. C088755 DF will replace the existing Transformer Bank at Commerce Ave Station 235 with a new larger 20 MVA transformer due to failure that occurred on 2/25/2021.
- **New Krumkill/Ave A Line (C091773)**, **New Krumkill Station (C091748), New Krumkill - Feeder Getaways (C083927)** - These projects and associated projects will provide for a new substation transformer, feeder getaways, express feeds, and the conversion and replacement of two existing 4.16kV feeders at New Krumkill substation. In addition, these projects will resolve loading issues and outage exposure criteria violations in the area.
- **Liberty St D-Line Overhead Rebuild (C083844)** - This project encompasses the rebuild and conversion to 13.2kV of overhead feeders from the Liberty St substation in downtown Troy, NY.
- **Delmar Feeders Rebuild and Convert (C083926)** - This project will convert and replace the 4.8kV feeders tied to the Delmar and Elsmere stations. This will increase reliability and allow for future growth within the Delmar area.

- **Seventh Ave North Feeder Conversion (C080476)** – The City of Troy is powered by antiquated infrastructure, with every substation serving our customers at our old voltage of 4.16kV. Not only is the infrastructure aging, but the City of Troy has also seen significant load growth; growth of which the 4.16kV cannot handle when compared to our current standard of 13.2kV. Adding to the significant load growth, thus requiring significant upgrades, is an increased installation of EV chargers, rising residential loading, new commercial businesses, and the electrification of city buses.
- **Seventh Ave Station Transformer Replacement (C080474)** - This project and associated projects provide for a new substation transformer at the Seventh Ave substation in Troy, NY and convert two 4.16kV distribution feeders to 13.2kV. This will ensure customers will continue to be served safely and reliably and prevent future overloading on the transformer while increasing capacity to accommodate future load growth.
- **Targeted Hosting Capacity Upgrades Distribution - NYE (C091879)** – In April of 2022 the commission issued an order that adopted the "Cost Share 2.0" methodology as part of Case 20-E-0543[6]. This program is to capture the Company's contribution to eligible cost share projects where developers have met the defined threshold for construction start. These funds are capped at two percent of a utility's distribution/sub-transmission electric fiscal year capital investment budget per the "Cost Share 2.0" methodology.
- **Union St 52 - County Hwy 59 (C056632)** – This project will rebuild and convert about two miles of County Highway 59 to 13.2kV to address an overloaded ratio transformer.
- **Delanson TB1 40MVA Rebuild (C092947)** – To address the Duanesburg Central School District's EV load expansion and increase system capacity, this project will rebuild Delanson TB1 to 40MVA with 3000 A equipment.
- **Hague Rd 52 - Convert Route 22 (C050717)** - The voltage in the Town of Putnam on the Eastern Shore of Lake George has experienced low voltage issues during the summer peak load. This project will rebuild and convert about three miles of 4.8kV distribution to 13.2kV. This will alleviate the overload of the ratio transformer, which is currently causing difficulty to maintain adequate voltage, address load imbalance on a section of the feeder, and relocate some inaccessible rear-lot distribution to the road.
- **IE - NE Distribution Transformer Upgrades - NYE (C015828)** - Distribution Transformer Upgrades in the Eastern, Central, and Western Divisions. Replace over loaded transformers as an asset strategy.

Central:

- **Cicero Substation (C091713 and C091779)** – The drivers for the new Cicero Substation are load relief and projected future load growth in the area. National Grid's North Syracuse distribution study area is in the Northern suburb of the City of Syracuse. It has received the majority of the new housing developments in the Syracuse metropolitan area. In the North Syracuse area, there are significant capacity and outage exposure issues that need to be resolved. The two major substations that need to be relieved are the Pine Grove Substation and the Bartell Rd Substation. The recommended solution to these concerns is to add distribution capacity to the area by constructing the Cicero Substation in the Town of Cicero, New York near the intersection of U.S. Route 11 and NYS Route 31. These projects are related to transmission project C093003.
- **Westminster Park Rd 81452 Rebuild (C052344)** - This project provides for the conversion of sections of single-phase 7.62kV and 4.8kV to three-phase 13.2kV to address the overloading on a step-down ratio transformer.

[6] *Case 20-E-0543 et al, Petition of Interconnection Policy Working Group Seeking a Cost-Sharing Amendment to the New York State Standardized Interconnection Requirements. Filed 11/30/2023.*

- **Cortland Area-study tie work (C091362)** - Cortland station has a couple of level 3 Assets conditions that need to be replaced within five years. Cortland station is also above summer normal loading and can push past summer emergency within the next seven years. This project will install padmount ties from Cortland 4.8kV to Starr RD/Fisher Ave 13.2kV.
- **Cortland Sta - LN1, 3, 18 THERM UPG (C088450**) - This project will replace the existing conductors in the breaker bays with new conductors to correspond to the rating of the transmission line conductors to support the State's Clean Energy Goals. New conductors will also be installed between line disconnects SW13 SW33 and SW183 and their respective take-off structures. This project supports CLCPA per PSC Case 20-E-0197.
- **Cortland LVAC Disassemble (C087469)** - This project will disassemble the City of Cortland LVAC Network into five individual secondary systems. The primary underground cable configuration will remain the same and the network transformers will be replaced once the system is converted from 4.8kV to 13.2kV.
- **Malone 2nd Bank Feeders (D-Line) (C082332)** - This project includes the distribution line components of the associated station project. The overall Malone station project will provide a new second transformer bank at Malone substation to eliminate all existing MWh violations.
- **Gilbert Mills Substation Transformer Upgrade (C046563)** - This project provides for the upgrade of transformer bank #1 to a 15/20/25MVA transformer and includes the installation of EMS at the station. This project supports CLCPA per PSC Case 20-E-0197.
- **North Carthage Substation Upgrades (C090054)** - This project is going to replace two existing circuit breakers and four disconnects in Wilna, NY. This project supports CLCPA per PSC Case 20-E-0197.
- **West Adams New Feeders TB2 (C084110)** - This project provides for a new second transformer at West Adams substation to eliminate MWh violations and provide additional capacity.
- **Salisbury Station (C093794 and C093800)** - Salisbury substation to be rebuilt with dual 40MVA transformers and additional feeders to alleviate system capacity constraints and boost hosting capacity. Rebuild to include additional feeders to distribute feeder level loading and improve switching capabilities in the area. This project also includes six getaways and risers out of new station, four to be tied into existing feeders. Approximately three miles of feeder buildout to split large feeders into smaller portions and enhance feeder.
- **Union Falls – Flood Mitigation – Distribution Substation (C078428)** - This project is part of Union Falls flood mitigation effort since the exiting substation is in a high-risk flood zone. The scope of work will retire the existing station and build the new Hawkeye 46kV Substation on adjacent property designed to mimic the electrical configuration of the existing Union Falls station. The new station work includes four 46kV breaker positions and one 2.4kV feeder for local distribution.
- **Sand Rd 2 Distribution Line upgrade (C093669)** – Due to load growth at the Syracuse Hancock Airport, this project will replace the 34.5/13.2kV 5MVA pad with a 10MVA pad. The existing regulators will also be replaced with 333kVA regulators.
- **Targeted Hosting Capacity Upgrades Distribution - NYC (C091880)** – In April of 2022 the commission issued an order that adopted the "Cost Share 2.0" methodology as part of Case 20-E-0543.[7] This program is to capture the Company's contribution to eligible cost share projects where developers have met the defined threshold for construction start.

[7] *Case 20-E-0543 et al, Petition of Interconnection Policy Working Group Seeking a Cost-Sharing Amendment to the New York State Standardized Interconnection Requirements. Filed 11/30/2023.*

These funds are capped at two percent of a utility's distribution/sub-transmission electric fiscal year capital investment budget per the "Cost Share 2.0" methodology.

- **Hancock 2 DLine upgrade (C093668)** – [Upgrade Hancock #2 ESS138 for Syracuse Airport expansion] Due to load growth at the Syracuse Hancock Airport, this project will replace the 34.5/13.2kV 5MVA pad with a 10MVA pad. The existing regulators will also be replaced with 333kVA regulators.
- **Debalso Expansion - Sub (C091746)** - This project is to address the needs for N-1 contingencies, asset conditions, and load growth in the West Utica Area. Expansion of DeBalso or Chadwicks stations to support load growth and N-1 contingency operations is likely while targeting retirement or replacement of stations with lower asset condition reports.
- **East Pulaski Transformer Upgrade (C046634)** - This project will upgrade the existing TB1 115kV/13.2kV 9.4MVA transformer with a 15/20/25MVA unit. This will address the normal overloading issues.
- **Bremen Substation Upgrades (C090030)** - This project will replace three existing substation disconnects with new units in New Bremen, NY. This project supports CLCPA per PSC Case 20-E-0197.
- **Cleveland D-Line (C093655)** – To address the age of equipment and system capacity due to forecasted loading, this project will install a 34.5/13.2kV 5MVA pad, recloser and 167kVA regulators. Also, 8.3 miles will be converted, and three three-phase ratio banks and one single-phase ratio bank will be installed.
- **Constantia D-Line Sub (C093653)** - To address the age of equipment and system capacity due to forecasted loading, this project will install a 34.5/13.2kV 5MVA pad. Also, 4.5 miles will be converted, and one three-phase ratio and two single-phase ratios will be installed.
- **Rome 55 Delta Conversion Phase 1 (C094210)** - Convert three Miles of three-phase delta to three-phase 13.2kV At Pole A in ROW Near Public Works.
- **IE - NE Distribution Transformer Upgrades – NYC (C014846)** - Distribution Transformer Upgrades in the Eastern, Central, and Western Divisions. Replace over loaded transformers as an asset strategy.

West:

- **W. Chautauqua Distribution Line Work (C055265)** - This project is for the feeder upgrades associated with the new West Chautauqua 34.5-4.8kV padmounted transformer mini substation which will be used to relieve and to provide resiliency to Chautauqua and Stow substations.
- **3012 Substation (C074909 and C085610)** - These projects and associated projects will provide for substation, sub-transmission line, and distribution line work to address loading concerns in the area.
- **New Royalton 13.2kV (C091747)** - This project is to create a new 115/13.2kV station to retire the nearby Royalton 34.5/4.8kV station. This project will address expected thermal limit and overload issues on Gasport TB1.
- **Buffalo Station 98 Sub (C091749)** - This project is to create a new 23/4.16kV substation to address rapidly growing load pockets within the City of Buffalo where existing Indoor substations are already upgraded.
- **South Eden Greenfield Substation (C046538 and C048015)** - This project and associated projects provide for the installation of a new 34.5-13.2kV substation between North Collins and Eden Center stations in addition to convert portions of North Eden, Eden Center, and North Collins feeders.

- **Targeted Hosting Capacity Upgrades Distribution - NYW (C091882)** – In April of 2022 the commission issued an order that adopted the "Cost Share 2.0" methodology as part of Case 20-E-0543.[8] This program is to capture the Company's contribution to eligible cost share projects where developers have met the defined threshold for construction start. These funds are capped at two percent of a utility's distribution/sub-transmission electric fiscal year capital investment budget per the "Cost Share 2.0" methodology.
- **Lord's Hill 67 Feeder 13.2kV Conversion (C093933)** - This project is the D-line work for the Lord's Hill 13.2kV conversion for Feeder 67. During the first week of September 2023, Lord's Hill TB1 load was 4.47MVA exceeding the SN rating of 4.46MVA. To resolve the issue, a 5MVA boutique padmounted transformer will be added at the station and the 67 feeders will be converted to 13.2kV.
- **Upgrade and Convert STA 74 SUB (C093600)** – This project is to relieve load growth in the area by converting the current Military Road 74 station from a three-bank 23kV to 4.16kV station to a one-bank 115kV to 13.2kV station.
- **IE - NE Distribution Transformer Upgrades - NYW (C010967)** - Distribution Transformer Upgrades in the Eastern, Central, and Western Divisions. Replace over loaded transformers as an asset strategy.
- **Lyndonville Transformer Replace (C091756)** - This project is to replace Lyndonville TB1 with Middleport TB1 once Middleport is retired/replaced with a new 115/13.2kV station. Lyndonville is currently operating above its thermal limits and will get to 128% of its summer normal rating by 2036.
- **New Machias Substation (C093642 and C093639)** – These projects will purchase land in the Machias area and build a new 115/13.2kV substation to relieve load off of Farmersville Station and Franklinville Station.
- Baker St 56 Delta Conversion Phase 1 (C093874) – This project involves converting three miles of three-phase delta portions of Baker St Feeder 15056 from 4.8kV to three-phase 13.2kV.
- **East Batavia 55 Delta Conversion (C093854)** – To address capacity concerns in the area, this project will convert three Miles of three-phase 4.8kV Delta to three-phase 13.2kV.
- **Buffalo Station 99 Sub (C091764)** – This new Buffalo station will resolve multiple system capacity issues across various stations in Buffalo.

Volt-Var Optimization ("VVO") / Conservation Voltage Reduction ("CVR"):

VVO/CVR is a practice where voltage control devices, such as capacitors, Load Tap Changing Transformers ("LTC"), and voltage regulators, are intelligently controlled in a coordinated manner to optimize the performance of the distribution system. This program is designed to reduce customer and grid energy consumption.

VVO refers to a process whereby the voltage and reactive power flow of the distribution system are optimized to improve the voltage management and power factor on a distribution feeder and potentially increase hosting capacity for DER. CVR refers to a process whereby voltage regulating devices are controlled to operate the feeder at the lowest possible voltage range, within allowable standards.

The Company's first VVO/CVR efforts began with the Clifton Park REV demonstration project in 2017. The Company has since initiated a statewide rollout in FY20, deploying VVO/CVR

[8] *Case 20-E-0543 et al, Petition of Interconnection Policy Working Group Seeking a Cost-Sharing Amendment to the New York State Standardized Interconnection Requirements. Filed 11/30/2023.*

schemes on 12 substations and 61 feeders through FY23. These deployments are currently undergoing a round of Measurement and Verification ("M&V") testing to monitor their performance. Beginning in FY25, the VVO/CVR program will transition away from independent studies and be incorporated into local area studies and relevant improvements. Once the Company's Advanced Distribution Management System ("ADMS") applications are ready, it is expected that these devices will be able to be controlled in a centralized fashion similar to the initial deployments from the independent studies.

In FY22, an initial selection of 13 non-planned VVO/CVR locations, had updates to existing LTC controllers (LTC Controller Program) to newer, modern controls that can integrate with the Company's current D-SCADA platform and the planned ADMS. The Company plans to begin using an application in ADMS to control voltage at the LTC, while monitoring customer voltage readings at their meters through a new AMI feedback loop. This will allow the LTC and its associated feeders to operate at the lowest possible voltage (within the limits of ANSI C84.1) to increase efficiency, reduce energy demand, and reduce energy consumption through LTC-only CVR. In addition, these newly updated LTC controls will enable real-time control capability and status monitoring for control center operators and support engineering studies. This will provide benefits that come with CVR to feeders that may not otherwise have a full VVO/CVR scheme deployed. The LTC Controller Program will be paused through FY26 as the Company looks to expand in other categories such as resiliency and reliability programs.

Drivers:
The Company has historically managed voltage primarily with the use of autonomously controlled LTCs, line regulators, and capacitors. When installed, regulators and LTCs are typically programmed to maintain a specific voltage at their locations as specified by a distribution planning engineer. Capacitors, when installed, are typically switched per setting programmed by a distribution planning engineer. Historically capacitors were fixed and manually switched on-and-off the circuit seasonally or as needed.

The primary driver of this project is to provide more efficient and higher quality power by monitoring the voltage performance across the system in real-time and automating the control of the various voltage regulating devices through an integrated centralized control scheme. The VVO/CVR practices add a layer of coordination, via communication and control, to optimize the use of regulators, capacitors, and line voltage monitors to respond to system dynamics in real-time. Over time, smart inverters are likely to also form part of the VVO/CVR scheme as more DER is integrated into the system and will continue to be evaluated through a New York State Energy Research and Development Authority ("NYSERDA") Program Opportunity Notice ("PON") 4128 project that started in December 2020.

Customer Benefits:
There are several anticipated benefits of a VVO/CVR deployment:

- Improved feeder power factor, flatter and lower voltage profiles, reduced feeder losses, reduced peak demand, and reduced energy consumption by customers which will vary based on the individual feeder characteristics.
- The increased near real-time operational data made available to the regional control centers, via data collected from automated capacitors and regulators, as well as line voltage monitors, will support the improved management of the distribution system and assist in the integration of future DERs.
- Potentially increased hosting capacity which would allow for greater levels of DER.

- Delivering voltages at the optimal levels will reduce energy consumption, improve service quality, and lower costs.

2023 to 2024 Variance:
The projected capital investment is shown in Table 4-10 below. National Grid continues to observe the performance of initial VVO efforts and expects to continue statewide deployment through area studies rather than independent program-based deployments. This transition accounts for a significant reduction in the program budgets shown below. This also reflects a shift towards programs such as FLISR that focus in the areas of reliability and resiliency improvements.

Table 4-10
Volt-Var Optimization / Conservation Voltage Reduction ("VVO/CVR") Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.0	10.4	11.4	11.2	-	33.0
2024	-	0.0	1.2	2.2	2.0	2.4	7.8

The following specific projects are classified as VVO/CVR and have planned spending in excess of $1 million in any fiscal year.

- NY LTC Controller – Distribution Substation (C085942) - This program covers the installation of new LTC controllers at distribution and transmission substations for the integration of new controllers at substations across NY state will enable advanced functionality through remote operation capabilities (i.e. ADMS applications or control center operator control). This project supports CLCPA per PSC Case 20-E-0197.

4. D. Asset Condition

Planned asset condition investment levels for the distribution system, and the comparison to investment levels from last year's Plan, are shown below.

2023 to 2024 Variance:
The variance between the 2023 and 2024 Plans is based on the scope and timing of the specific projects in this category, as well as the re-categorization of asset condition projects with secondary drivers such as increasing system capacity, hosting capacity, and maintaining reliability under the new spending rationale, Multi-Value Distribution.

Table 4-11
Asset Condition Spending Rationale Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	120.5	106.5	147.5	174.6	179.7	-	728.9
2024	-	78.6	118.0	139.4	158.1	152.3	646.3

Funding levels for the programs and projects included in the Asset Condition rationale are presented below.

Inspection and Maintenance:
The Company performs visual inspections on all overhead and underground distribution line assets once every five years. Each inspection identifies and categorizes all necessary repairs, or asset replacements, against a standard and in terms of criticality to maintain customer safety and reliability in compliance with the Commission's Safety Order in Case 04-M-0159.[9] The Company also performs annual contact voltage testing per the Commission's Safety Order on all facilities that are capable of conducting electricity and are publicly accessible, such as streetlights.

2023 to 2024 Variance:
Current investment forecasts are based on actual expenditures being incurred with the on-going I&M program. The change in future variance in this year's Plan compared to previous years relates primarily to an expected change in the amount of work identified.

Table 4-12
Inspection and Maintenance Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	30.8	34.9	34.9	35.9	39.8	-	176.3
2024	-	30.1	31.2	32.5	34.7	36.0	164.6

Primary and Secondary Underground Cable:

A strategy has been implemented for the proactive replacement of underground cable on the Sub-Transmission, Distribution Primary, and Distribution Secondary systems in all three divisions of the upstate New York service territory. Sub-transmission and Distribution cable replacements will be completed through a series of specific projects targeting cables based on their past performance, history of failures, asset age, cable construction, design deficiencies, loading, and critical customers served. Three individual program funding numbers for the Eastern, Central and Western divisions will be used for secondary cable replacements. Additionally, cable replacements in support of new customer development and public works projects are also anticipated.

Drivers:
The proactive replacement of electric utility assets such as aged underground cable is expected to reduce the risk of failures or unplanned events and enhance the reliability and capacity of the overall system.

Customer Benefits:
Cable systems are often designed with greater redundancy than overhead systems, and cable failure often has a limited impact on customer reliability statistics. However, if cable performance deteriorates significantly, the likelihood of concurrent failures increases. Cable failures can result in increased operation and loading on parallel equipment, further increasing the risk of failure on the rest of the system. The consequences of multiple secondary network failures or multiple primary cable failures can be significant. Proactive replacement of aged cable in these systems is expected to reduce the risk of concurrent failures and the potential for large scale customer outages in urban areas, including critical loads such as police, fire departments and hospitals.

[9] *Case 04-M-0159, Proceeding on Motion of the Commission to Examine the Safety of Electric Transmission and Distribution Systems, Order Adopting Changes in the Electric Safety Standards (issued and effective Dec. 15, 2008, revised in March 2013) ("Safety Order").*

2023 to 2024 Variance:
The projected program investment is shown in Table 4-13 below. The variation year-on-year is due to the scope and timing of specific projects. Also, since secondary underground cable systems are typically in dense urban areas, costs associated with these replacements can vary due to congestion and accessibility.

Table 4-13
Primary and Secondary Underground Cable Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	7.4	4.4	10.3	11.5	13.1	-	46.8
2024	-	5.2	11.1	13.2	19.5	22.0	71.0

The following specific projects are classified under the Primary and Secondary Underground Cable program and have planned spending in excess of $1 million in any fiscal year. Details on the planned spending profiles for these projects are included in Exhibit 3.

- **Cable Replacement – Network (C078270 - NYE, C091744 - NYC, C077338 - NYW)** - This program is for targeting the replacement of cables based on past performance, support of new customer development, and public works projects.
- **MV-Camp KillKare/Lake Kora-Cable (C088822)** - Replace Three "transformer houses" (a.k.a. "dog houses") along the Kamp Kill Kare spur with one padmounted switchgear and four three-phase padmount transformers. "Transformer Houses" (a.k.a. "dog houses") are wooden shed-like structures with overhead fuses/overhead transformers installed within. Rework the four existing “dog house” services with three-phase padmount transformer services and change the customer's service voltage from the non-standard 240V two-phase open delta five-wire service with 120V for the lights to the company standard service voltage 120/208V three-phase four wire wye grounded system.
- **Underground Residential Distribution/ Underground Commercial Distribution (“URD/UCD”) Cable Replacement (C094116 - NYE, C094137 – NYC, C094139 - NYW)** – The Company is targeting the replacement of cables based on past performance that feed URDs and UCDs to maintain reliability on the system.
- **MV Island Transformer Replacement - Central Division (C026977)** - Replacement of 'dog houses' in the Central Division which are fuse/transformer installations mounted in wooden sheds. Replace related cable.

Buffalo St Light Cable Replacement:

This program promotes safe and reliable underground-fed street light service by replacing faulty street light cables and conduit.

Drivers:
This program systematically replaces deteriorated street light circuit cable in the City of Buffalo area to address repetitive incidents of elevated voltage as determined through periodic testing under electric operating procedure NG-EOP G016.The underground street light cable system in the City of Buffalo metropolitan area is comprised of a variety of electrical cable types and wiring configurations that have been in service for more than 50 years. In areas with aging street light cable, elevated voltage testing continues to identify elevated voltage incident rates that are from 2-20 times the rates measured in other areas in the Company’s service territory. Areas that have had the street light cable replaced through this program are not experiencing elevated voltage incidents.

The primary driver for elevated voltage in this area is the deteriorated physical condition of the street light cable, and installation of new circuitry has resulted in a dramatic reduction of elevated voltage incidents associated with that street light infrastructure.[10]

Customer Benefits:
This work will provide more reliable street light service and reduce the incidence of elevated voltages in the Buffalo area.

2023 to 2024 Variance:
The Company expects to spend approximately $2.5M annually under this program, as has been the case for recent years. The projected investment is shown in Table 4-14 below.

Table 4-14
Buffalo St light cable replacement Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	2.0	2.0	3.0	3.5	4.0	-	14.5
2024	-	2.0	3.0	3.5	4.0	4.0	16.5

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **Buffalo Street Light Cable Replacement (CD00851)** - Install new cable and/or conduit and replace existing UG street light cables. Also remove any temporary OH street light cable.

Substation Asset Condition Programs:

Replacement or refurbishment of substation assets frequently has long lead times and requires significant projects in terms of cost, complexity, and project duration. Consequently, it is often more efficient, as well as cost-effective, to review the asset condition of the entire substation. Further, where there are asset condition issues that indicate replacement as an option, the Company reviews planning and capacity requirements to ensure alternative solutions are evaluated, such as system reconfiguration to retire a substation.

Substation Power Transformers:

Power transformers are large capital items with long lead items. Their performance can have a significant impact on reliability and system capacity. Condition data and condition assessment are the key drivers for identifying replacement candidates. Replacements are prioritized through a risk analysis which includes feedback from operations personnel. This program covers transformers which are identified as replacement candidates through the test and assessment procedure. A Watch List of candidate transformers has been identified based on their condition and recorded in the Asset Condition Report[11]

Drivers:
Power transformers are evaluated based on visual inspections and routine testing performed per the Company's electric operating and maintenance procedures. Each unit is given a condition

[10] *Electrical connections associated with unauthorized 3rd party attachments to the street lighting electrical system recently have been determined to be the source of an increasing number of elevated voltage incidents in Buffalo.*
[11] *Report on the Condition of Physical Elements of Transmission and Distribution Systems, Case 20-E-0380, filed most recently October 1, 2022.*

code based on individual transformer test and assessment data, manufacture/design, and available operating history. Higher codes relate to transformers which may have anomalous condition. Units with a higher code are subject to more frequent monitoring and assessment and are candidates for replacement on the Watch List.

Customer Benefits:
The impact of power transformer failure events on customers is historically substantial. By proactively replacing units in poor condition, there will be direct benefits to customers in reducing the likelihood of an in-service failure.

2023 to 2024 Variance:
The project program investment is shown in Table 4-15 below. Through on-going review of the distribution substation transformer fleet, new problems are identified as they arise. Replacement costs and related annual investment will vary based upon the size of the transformer to be replaced. In addition, re-phasing of projects and their timelines has contributed to the variance.

Table 4-15
Substation Power Transformers Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.0	1.6	12.7	15.3	16.6	-	47.3
2024	-	0.1	8.3	11.1	17.9	23.8	61.2

The capital investment plan in Exhibit 3 shows the current list of transformers expected to be replaced within the next five years. The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **Altamont TB2 (C086700)** - This project will upgrade the existing 22.4MVA transformer bank to address asset condition and hosting capacity concerns.
- **Trinity TB4 and TB6 Transformers and Bus (C086717)** - This project provides for the replacement of TB4 power transformer at 115/13.2kV (33/44/55MVA) and TB6 power transformer at 115/13.2kV (33/44/55MVA).
- **Lewiston Heights 086 Replacement TB1 (C083225)** - This project is to replace TB1 at Lewiston Heights Station 086 due to asset conditions and it is a family class issue.
- **IE – NY ARP Transformers (C025801)** - Transformer Program for Power Transformers that need to be replaced due to asset condition.
- **NY ARP Spare Substation Transformer (C026055)** - Program for Spare Power Transformers for NY distribution substations.
- **Proactive Transformer Program (C093863)** - Program for the purchase of Transformers for projects early due to increasing lead times for power transformers.

Indoor Substations:
The purpose of this strategy is to replace, retrofit, or retire the 18 remaining indoor distribution substations. Indoor substations were built between the 1920s and 1950s.These substations have inherent safety risks due to design and equipment condition. Due to their vintage, there is a lack of spare equipment (transformers, oil switches, relays, etc.), as they are no longer being produced and are obsolete. Details of the asset condition issues, and key drivers are outlined in the Asset Condition Report.

Drivers:
These indoor substations are obsolete. Their outdated design does not meet current accepted safety criteria. Equipment and protection schemes are becoming unreliable in their function of interrupting faults and show signs of general deterioration.

Customer Benefits:
Under normal conditions, failure of obsolete indoor substation equipment could result in sustained customer interruptions until an acceptable replacement is installed. Equipment outages can also result in increased operation and loading on parallel equipment. Indoor substations typically supply urban environments, including critical loads such as police, fire departments, and hospitals. This program mitigates the risk for a long-term, sustained, customer interruption.

2023 to 2024 Variance:
The projected program investment is shown in Table 4-16 below. The spending has been modified based on a redistribution of projects mostly to MVD and further development of the plan for each substation.

Table 4-16
Indoor Substations Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	23.8	16.4	10.8	5.9	24.4	-	81.4
2024	-	0.0	3.0	2.1	5.7	5.0	15.8

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **Beech St 81 - Indoor Substation Refurbishment (C046577)** – This project will refurbish the existing obsolete 12kV - 4.16kV station transformers with 13.2kV - 4.16kV, two 9.375MVA transformers. Assets located in Beech St 81 in Niagara Falls have numerous reliability and safety concerns due to age related issues. Obsolete equipment does not meet current requirements for fault interrupting capability, operating interfaces, and personnel safety. In addition, obsolete equipment makes repairs and acquisition of spare parts difficult. A substation refurbishment program is anticipated to address these concerns.
- **Substation Roof Program (C093850 - NYW)** – This program aims to address National Grid's NY indoor substation roofs with asset condition issues. This program will establish a plan to replace the roofs as they begin to exhibit deterioration. This program would cover the roofing, flashing and any brickwork replacement.

Metal-Clad Switchgear:
Deteriorated metal-clad switchgear can be prone to water and animal ingress, which can lead to failure. Visual surveys will detect such degradation but cannot identify surface tracking hidden behind metal enclosures. Identification of these concerns is more likely with electro-acoustic detection techniques which utilize sensors to detect anomalous identify equipment condition concerns before failure. An initial review of the service territory using this technique identified several locations for further action as part of this strategy. This program work is coordinated with other asset replacement programs, where appropriate.

For each substation, an analysis will be conducted to determine if direct replacement is the best course of action or if there is an alternate means of supplying the load.

Drivers:
Metal-clad switchgear installed prior to 1970 has several factors that can lead to component failure. Electrical insulation voids were more prevalent in earlier vintage switchgear. Higher temperatures due to poor ventilation systems can also degrade lubricants in moving parts such as breaker mechanisms. Gaskets and caulking also deteriorate over time leading to ingress of moisture.

Customer Benefits:
The impact of each metal-clad switchgear event on local customers is usually substantial, with nearly 2,000 customers interrupted for over three hours per event. This program would reduce the risk of such events and provide significant benefits to the affected customers.

2023 to 2024 Variance:
The projected program investment is shown in Table 4-17 below. The capital forecast reflects new condition assessment data and analyses that helped identify and prioritize replacement and refurbishment candidates. Multiple stations are in progress with a program underway to prioritize additional stations.

Table 4-17
Metal-Clad Switchgear Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	10.7	12.6	22.4	26.2	15.3	-	87.2
2024	-	8.6	12.0	28.4	24.8	19.5	93.4

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **Metalclad Replacement Program (C084936)** – This statewide program is to replace metal-clad switchgear that is in poor condition. Individual units will be evaluated through various inspection or testing methods and prioritized based on condition.

East:
- **Pinebush – Refurbish Metalclad Switchgear (C046744)** - This project will cover costs associated with the metalclad switchgear refurbishment for Pine Bush substation.
- **Blue Stores Substation (C081611)** - This project replaces the metal-clad switchgear, circuit switcher, and transformer with new equipment due to asset condition.
- **Sycaway - Metalclad Replacement (C081630)** - Sycaway Station is a 115/13.2kV (22.4 MVA) two bank substation. Each transformer is supplied eight feeders with two metalclad switchgear units. This location has forecasted load that will require a station rebuild by 2035, so during this metalclad replacement, this scope will have new metalclad rated for 3000Amps.

Central:
- **Tuller Hill Station 246 (C056611)** - This project replaces the existing metal-clad substation with new equipment, including a new transformer.
- **Pine Grove Metal-clad Switchgear (C056614)** - This project replaces the existing metal-clad switchgear with new equipment.

- **Little River Station 955 (C085010)** - This project started as a metal-clad switchgear replacement but has expanded into a station rebuild project.
- **Rock Cut Metalclad (C083445)** - Project is to replace the metal-clad at Rock Cut Substation due to asset condition issues.

West:

- **Station 61 Metal-Clad Switchgear (C051707)** - This project is for the replacement of existing circuit breakers, transformers, and bus-work due to asset condition.
- **Station 162 Metalclad Replacement (C052706)** - The metalclad switchgear will be replaced at this station due to asset condition. The metalclad switchgear was manufactured prior to the 1970s, so therefore it has an inferior bus insulation and is prone to partial discharge. The replacement of the metalclad switchgear is in align with the metalclad switchgear replacement strategy.

Substation Circuit Breakers and Reclosers:

Certain types, or families, of breakers have been specifically identified for replacement in the next ten years. Breaker families are typically older, obsolete units that are less safe or less reliable. Certain breaker families that are targeted for replacement contain parts that must be custom-machined or units that contain asbestos in the interrupting systems and require extra precautions during maintenance, refurbishment, and overhaul.

Drivers:

The approach for breaker condition coding was based on engineering judgment and experience which was supported by discussions with local Operations personnel. The units are prioritized for replacement based on the condition coding; units in poorer condition are given a higher score. Many of these breakers are obsolete.

Aged units have been specifically identified for replacement because they are difficult to repair due to the lack of available spare parts. Likewise, unreliable units have been identified for replacement to reduce the number of customer interruptions.

Customer Benefits:

In addition to providing reliability benefits, several of the targeted breaker families present opportunities to reduce hazards associated with safety and the environment (*i.e.*, oil and asbestos).

2023 to 2024 Variance:

The projected program investment is shown in Table 4-18 below. The overall spend has been modified based on lessons learned regarding scheduling, availability of resources, and a more accurate identification of breakers per station location.

Table 4-18
Circuit Breakers and Reclosers Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	2.1	2.1	4.8	6.2	4.8	-	20.0
2024	-	3.3	7.8	4.5	5.1	5.8	26.5

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **NW ARP Breakers & Reclosers (C032261)** – This Funding Project Number is for the Breaker Program in the Western Division to replace identified asset condition and family class issue breakers.
- **NYE ARP Breakers & Reclosers (C032252)** - This Funding Project Number is for the Breaker Program in the Eastern Division to replace identified asset condition and family class issue breaker.
- **NYC ARP Breakers & Reclosers (C032253)** - This Funding Project Number is for the Breaker Program in the Central Division to replace identified asset condition and family class issue breaker.
- **Station 54 – Feeder Breakers (C094290)** - This Funding Project Number is part of the breaker program for the replacement of all the feeder breakers based on asset condition.
- **Proactive Breaker Program (Distribution) (C093866)** – This Program is to provide funding for early purchase for distribution substation circuit breakers due to the increasing lead times.

Substation Batteries and Related:

This program mirrors the Transmission Substation Batteries and Chargers program. Battery and charger systems are needed to ensure substation operational capability during both normal and abnormal system conditions. The intent of this program is to replace battery and charger systems that are 20 years old. The 20-year limit is based on industry best practice and experience in managing battery systems. This program work is coordinated with other asset replacement programs, where appropriate.

Currently, there are over 368 substation battery banks in service across all distribution substations. To bring all battery systems to less than 20 years old within ten years would require a replacement rate of approximately 13 battery banks per year.

Individual battery problems may be identified at any time during Visual and Operational inspections or periodic testing. Problems identified through these methods are addressed under the Damage/Failure spending rationale.

Drivers:
Failure of batteries and charger systems may result in substation protective relays and/or circuit breakers not operating as designed.

Customer Benefits:
Battery and charger system failures can result in additional customers being interrupted as back-up relay schemes at remote substations will have to isolate a fault. It may also result in equipment damage if a fault is not cleared in a timely fashion. Interruptions related to battery incidents are uncommon at this time, as the replacement program is progressing as desired.

2023 to 2024 Variance:
The projected program investment is shown in Table 4-19 below. The budget has been adjusted to reflect the population of batteries approaching industry best practice replacement age over the next several years.

Table 4-19
Substation Battery and Related Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.9	0.9	0.9	0.9	0.9	-	4.5
2024	-	0.9	0.9	0.9	0.9	0.9	4.5

There is no specific project in this category forecasted with planned spending in excess of $1 million in any fiscal year.

Mobile Substation:

Mobile substations are key elements for ensuring continued reliability and supporting the system during serious incidents.

Drivers:
To improve the management of the mobile substation fleet, the Company conducted a review which considered system requirements, the amount of mobile usage, and the uniqueness of individual units to better understand the condition of all members of the fleet and their associated risks. Highly utilized units may present a risk if they are not properly maintained or refurbished. Further, uniquely configured units or very highly utilized units in which there is only one available unit on the system, present some risk since they may not be available for an emergency due to utilization elsewhere. Based on the review, mobile substation protection upgrades, rewinds, and replacement units were recommended.

Customer Benefits:
A mobile substation or transformer is the quickest method for restoring service to customers when an outage occurs in a substation, which is typically within 16-24 hours. By refurbishing, upgrading, replacing, and purchasing new mobile substations, as necessary, via system reviews and condition assessments, the risk of extended customer outages will be significantly reduced. In addition, properly addressing the needs of the mobile fleet will allow us to schedule maintenance for substation transformers in a timely manner. Lastly, having an adequate number of mobile substations on-hand will promote the completion of new construction projects on-time and on-budget.

2023 to 2024 Variance:
The projected investment is shown in Table 4-20 below. Projects have been redistributed based upon changes in asset condition and the availability of the units so that upgrade work can be performed.

Table 4-20
Mobile Substation Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.1	0.0	1.5	1.5	3.0	-	6.1
2024	-	0.7	3.5	2.8	3.0	3.0	12.9

The following specific projects are expected to exceed $1 million in any fiscal year:

- **NY Mobile Substation Program (C051744)** - This program is for identifying mobile substations that are in need of replacement.
- **Mobile 4C – Mobile Substation Replacement (C089181)** -This Funding Project Number is for the funding to replace Mobile Substation 4C.
- **Mobile 9C – Mobile Substation Replacement (C089184)** - This Funding Project Number is for the funding to replace Mobile substation 9C.

4. E. Multi-Value Distribution (MVD)

Multi-Value Distribution ("MVD") projects combine proactive asset replacements driven by poor condition with an expanded scope to increase system capacity where appropriate. MVD Projects provide benefits to system capacity. Historically, Multi-Value Distribution projects were captured under the Asset Condition spending Rationale. In 2023, National Grid recognized the importance of highlighting Multi-Value Distribution as its own category with two core concepts: Asset Condition and System Capacity. The projects detailed below have a primary driver to replace or retire distribution assets in poor condition with a secondary driver to also proactively upgrade assets to increase system capacity.

2023 to 2024 Variance:

The variances between the 2023 and 2024 Plans are shown in the table below, and variances in the scope and timing of specific projects in this category are described below. The Multi-Value Distribution spending rationale is new; therefore, the variance will be the total amount shifted from the Asset Condition rationale with increased scope.

Table 4-21
Multi-Value Distribution Spending
Rationale Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	64.7	84.7	101.4	115.8	96.8	463.5

MVD System Capacity

The MVD system capacity strategy includes those projects where major asset refurbishments have been identified coupled with increasing capacity. These projects encompass proactively replacing assets identified to be in poor condition with higher rated equipment and other associated asset replacements or installations as needed to support the system capacity increases.

Drivers:
The investments in this strategy are driven by the need to address the Company's increasingly aging and obsolete infrastructure and meet the ever-increasing customer electrification and decarbonization demands to ensure safe and reliable network operation.

Customer Benefits:
The MVD System Capacity strategy can maximize the utilization of existing asset condition projects and planned system capacity needs while avoiding the cost of under-built or otherwise inefficient solutions which only address a single asset condition issue.

2023 to 2024 Variance:
The projected program investment is shown in Table 4-22. The variation year-on-year is due to scope and timing of specific projects in this category. The Multi-Value Distribution – System Capacity program name is new therefore the variance will be the total amount shifted from the various programs in the asset condition rationale with increased scope.

Table 4-22
Multi-Value Distribution Asset Condition - System Capacity ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	62.9	83.9	100.7	115.6	96.3	459.5

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

East:

- **Swaggertown 54 and Scotia Conversion (C091774)** - This project will fund the construction of the new three-phase 13.2kV feeder from the Swaggertown 364 substation into the Village of Scotia via Spring St and Sacandaga Rd. It will fund the conversion of the 4.16kV feeders that today make up the Scotia 4.16kV feeders (36_32_255). It will fund the construction of double circuit feeders necessary to extend the Swaggertown 36453 and 36454 into the Village of Scotia down Sacandaga Rd and any other ancillary D-Line construction to adjust feeder loading in the surrounding area to a level necessary for forecasted 2033-2037 loading.
- **Swaggertown Station Upgrades (C091754)** - This project will upgrade the 115kV/13.2kV station transformer TB1 at Swaggertown to a 40MVA bank, replace 115kV circuit switcher 6177, replace all 15kV class oil filled circuit breakers, and add a fourth feeder breaker to accommodate a new 36454 feeder. These upgrades will resolve all substation asset condition issues, loading concerns in the 2032-2037 timeline, and provide an additional 22.9MVA hosting capacity.
- **Delaware D-Line (C091776)** – To resolve asset condition issues, this project will convert the Delaware 33053 feeder from 4.16kV to 13.2kV and transfer its load to the Delaware 33052. This will allow for the retirement of Delaware TB1 which has ongoing Asset Condition issues placing load on Delaware TB2.
- **Knapp Rd Station (C093760)** – Due to forecasted load increases at Chestertown 042 substation, the Knapp Rd substation will be upgraded from a 34.5kV switching station to include a new 115/13.2kV, 40MVA transformer with four feeders and include a 115/34.5kV, 50MVA transformer. The new Knapp Rd substation will absorb all distribution line assets from Chestertown 042 while reinforcing the 34.5kV system supplying the Southern Adirondacks.
- **Ruth Rd Station Rebuild (C081613)** - The Karner 317 substation has significant asset condition issues and serves a 4.16kV island in the Town of Colonie. This project is to rebuild the Ruth Rd 381 substation with two 40MVA station transformers and eight distribution feeders to allow for the retirement of the Karner 317 substation and conversion of the Karner distribution to 13.2kV while providing ample capacity for future load growth.
- **Karner 4.16kV Feeder Conversions (C049958)** - This is under the Ruth Rd area study and is responsible for the D-Line work associated with converting the Karner OH distribution feeders to 13.2kV and tying them out to the new feeders that were constructed under the Ruth Rd and the Sand Creek D-line FPs, C052304 and C052306 respectively.
- **Ruth Rd Rebuild Distribution Work (C052304)** - Distribution work associated with the rebuild of the Ruth Rd 381 substation into a two-bank, eight feeder substations per the Ruth Rd Area study.
- **Sand Creek 54 Distribution (C052306)** - Constructing a new Sand Creek 45254 distribution feeder will allow the conversion and transfer of multiple existing Karner 4.16kV distribution feeders as per the Ruth Rd Area Study.

- **Corliss Park TB2 & Bus Install (C081991)** - Install a new 12/16/20 MVA, 34.5 kV/12.3 kV transformer, TB2, with related bus extension and 13.2kV breakers, at the Corliss Park 338 substation.
- **Liberty St 34.5/13.8kV Subs Transformer (C081420)** - This project provides for the replacement of one power transformer. This project will also address other asset condition issues at the substation, including replacing targeted and deteriorated equipment.
- **Newtonville Area Study: Johnson (C091023)** - Replace both transformers, TB1 and TB2, each with a 40MVA. Replace both metalclads, each rated for 3,000A with six breakers.
- **Newtonville Area Study: D-Line (C091022)** - Installation of 1000 CU cable, in concrete-encased conduit, to commission a fourth feeder out of Forts Ferry substation. Installation of 1000 CU cable, in concrete-encased conduit, to commission a seventh feeder out of Johnson substation. Replacement of all existing, direct-buried getaway cables out of Johnson substation with 1000 CU in concrete-encased conduit. Replacement of all existing, direct-buried getaway cables out of Maplewood substation with 1000 CU in concrete-encased conduit. Replacement of all existing, direct-buried getaway cables out of Forts Ferry substation with 1000 CU, in concrete-encased conduit, up to the first switch. Using 336 AL, install new three-phase, 13.2kV distribution along Wade Rd Extension, between Sparrowbush Rd and Forts Ferry Rd. Using 336 AL, extend three-phase, 13.2kV along Latham Ridge Rd, Ford Avenue, Broadway, and Scully Avenue. Using 336 AL, extend three-phase, 13.2kV along Latham Ride Rd, between Ford Avenue and Miller Rd, and remove all rear-lot distribution. Convert the entirety of the Newtonville 30567 to 13.2kV. Convert the entirety of the Newtonville 30568 to 13.2kV. Convert the entirety of the Newtonville 30581 to 13.2kV. Convert the entirety of the Newtonville 30583 to 13.2kV. Convert the entirety of the Newtonville 30584 to 13.2kV.
- **Smith Bridge 2nd Bank & Metalclad (C081418)** - This project will expand Smith Bridge to a two-bank station by installing a 40MVA transformer and a new metalclad to enable the retirement of the Saratoga Substation which has significant asset condition issues.
- **Smith Bridge - New TB2 Getaways (C083483)** - The Smith Bridge Substation is being expanded from a one to a two-bank station to allow for the retirement of the Saratoga Substation to address the significant asset conditions issues which exist at Saratoga. This project will construct feeder getaways for three new 13.2kV distribution feeders.
- **Smith Bridge 56 & 57 - Build Feeders (C083485)** - Construct new Smith Bridge 56 & 57 feeders using former 34.5kV lines into Saratoga to support the expansion of Smith Bridge substation and the retirement of Saratoga Substation which is necessary due to asset condition issues at the Saratoga Substation.
- **Manheim Distribution (C074489)** – To address asset condition issues and historical flooding issues at the Inghams Substation, this project will connect the existing 13.2kV Inghams distribution feeder 02051 to the new Manheim substation while also creating a new distribution feeder which will be used to relieve the load on the nearby Salisbury Substation.
- **Cobleskill Area Study D-Line (C091671)** – This project is required to convert the Cobleskill 11,12,13 feeders from 4.8 to 13.2kV, which will enable the energization of the new 69kV/13.2kV TB2 at Cobleskill. This conversion will enable future expected load growth capacity on the Cobleskill feeders.
- **Cobleskill Connect Transformer TB2 (C086902)** - Installs a new 69kV circuit switcher, low side bank breaker and three feeder breakers to energize 13.2kV distribution transformer TB2 to the Cobleskill substation. This project will also address all asset condition concerns at Cobleskill and remove old 4.8kV equipment.

- **Avenue A Station 291 Metalclad Replacement (C056609)** - This project is to replace the 34.5kV metal-clad switchgear due to asset condition issues in line with the metal-clad strategy.
- **Riverside 28855 UG Cable Replacement (C036468)** – This project will install approximately 6,000ft. of new duct-line and manhole system to facilitate the eventual replacement of the Riverside 28855 with up to 1000 MCM Cable.
- **Burdeck Station Rebuild (C093727)** – To relieve Burdeck station's TB1 of overheating issues, loss of life, and forecasted load, this project will retire the existing TB1 and install two 40MVA transformers. Retire the existing Metaclad and install two new six-position Metalclads for station capacity of eight feeders.

Central:

- **Mexico D-line (C093643)** - To address system capacity and asset condition issues, this project will install a 34.5/13.2kV 7.5MVA padmount transformer, reclosers, regulators, and convert 9.7 mi. D-line & Ratios
- **Stittville Station D-line (C093785)** – To address system capacity and asset condition issues, this project will build three new feeder getaways out of the substation, extend new feeders North and South out of the station, split existing feeders out onto new feeders including approximately five miles of OH line build for new feeders to tie locations.
- **Dorwin D-lines (C093699)** – This project and associated projects will retire Dorwin substation after boutique substations are built and serving load.
- **Alder Creek Substation Rebuild (C093792)** – This project will address asset condition issues at Alder Creek substation, as well as system capacity violations on the 4.8kV bank in 2022, forecasted violations on the 13.2kV in 2033 and hosting capacity increase to the area. This project will rebuild Alder Creek with 7.5MVA 46/13.2kV boutique station. Conduit and cable to three-position switchgear and convert approximately ten miles to 13.2kV.
- **Central Utica Boutique Sub – D-Line (C093808)** – This project is to address capacity and asset condition concerns at Pleasant/Conklin substations. Install new 10MVA 46/13.2kV boutique substation in proximity of existing Pleasant or Conklin substations and convert approximately ten miles of d-line to 13.2kV with ties to adjacent 13.2kV feeders.
- **Chadwicks Expansion - D-line (C093804)** – This project will expand Chadwicks station with a second bank (40MVA) and four open air feeder positions to support load and retirement of neighboring 5kV systems.
- **Third St. Retirement D-Line (C093651)** – To be able to retire Third St. Substation and address asset condition issues at Granby Center substation, this project will convert 16 miles of 4.8kV to 13.2kV and place load on new Granby Center feeder. Additionally, eight single-phase ratios and one three-phase ratio will be installed.
- **E. Fulton Station Retirement D-Line (C093649)** – Due to asset condition issues, East Fulton substation will be retired, and the load will be placed on Whitaker substation. This project will convert all 9.7 miles of East Fulton from 4.8kV to 13.2kV and place it on a new Whitaker feeder.
- **Whitaker Station Expansion (C093648)** – To be able to retire East Fulton substation and facilitate additional DG interconnects, this project will add a second transformer and switchgear at Whitaker substation.
- **Granby Center Expansion (C093650)** – To address asset condition issues at both Granby Center and Third St, this project will install a 115/13.2kV 40MVA and switchgear at Granby Center.

- **Debalso Expansion - D-Line (C093802)** – This project will expand the DeBalso station with a second transformer (40MVA) and four open air feeder positions to support load and retirement of neighboring 5kV systems.
- **Temple Distribution Rebuild (C079534)** - The two new stations will reuse the existing three station transformers and will have a fourth transformer; so, each of the new stations will be supplied with two station transformers. The south station will be of “open air” construction and configured with a “breaker and a half” bus. The south station (i.e. “breaker and a half” portion of Temple St station) will supply the network feeders and the critical (hospitals) all underground feeders. The north station will be of “open air” construction and configured with a “straight” bus. The north station will supply the non-critical loads.
- **UG for Temple Rebuild (C079532)** - This project is the underground work required for the rebuild of Temple St Substation. There will be 3,000ft. of new conduit, six new manholes and 14,500ft. of new cable. This underground work will reconnect the existing 20 feeders to the two new “open bus” stations at Temple St Station.
- **Syracuse – State St – Cables (C083235)** - This project will replace over 43,000ft. of underground cable for 18 separate electrical systems in the City of Syracuse area.
- **Fayette St Substation (C081981)** - Fayette St substation is being rebuilt due to asset condition issues. Fayette is a 34.5-4.16kV substation. As part of the rebuild, it is being converted to 13.2kV. Fayette St, along with Ash St, Park St, and Galeville, form a 4.16kV pocket on the North and West side of the City of Syracuse.
- **Rebuild Ash 4160 (C082032)** - Rebuild and convert Ash St 4.16kV and place it on the new 13.2kV at Fayette St and Galeville.
- **Galeville Station Rebuild (C050746)** - Galeville is 34.5/4.16kV station surrounded by 13.2kV stations Ash St and Hopkinton Rd with limited tie capability. Several asset condition issues were identified at Galeville Substation: Westinghouse Type DH AMCB breakers 1958 to 1963 vintage. Convert Galeville station from 4.16kV to 13.2kV standard by replacing the existing transformer with 34.5/13.2kV 7.5/9.395MVA unit and the Metalclad with open air configuration with three feeders.
- **Galeville 71, 72, & 73 Feeders Conversion (C050749)** - This project is a distribution line portion of Galeville station rebuild project C050749. The main driver for the project is the asset condition of Galeville transformer and Metalclad.
- **Cortland Area-Study D-Line Work (C090298)** - This project is the D-line work for the Cortland area study. It involves: Dismantling the Cortland Underground into radial lines, Converting the 4.8kV Underground to 13.2kV, Converting the 4.8kV Overhead line to 13.2kV, Installing 13.2/4.8kV padmounts for McGraw 4.8kV feeder tie
- **Mill St Station Rebuild (C084102) -** To address asset condition issues - Mill St substation will replace TB1, TB2, and TB3 within seven years. Mill St will replace existing station transformer with two station service transformers with two new steel stands, seven PTs, the control house foundation needs to be repaired, new 23kV lightning protection, and a fence replacement within seven years.
- **MV-Clinton TB1 Replacement HC (C086880)** – This project is to replace Clinton TB1 for asset condition and investigate a larger bank for load and hosting capacity.
- **West Adams 2nd Bank (C084111) -** This project is to add a second 115/13.2kV station transformer at West Adams substation. This project will allow for the retirement of Dexter substation and will create a new distribution feeder. This project supports CLCPA per PSC Case 20-E-0197.

West:

- **Sonora Way Station - New SWG (C060141)** - Install a new six-position switchgear at Sonora Way Station and construct three new 13.2kV feeder getaways. Purchase land and extend fence to allow access & use of existing mobile connect.
- **Sonora Way - New Feeders (C046552)** - Lakeville Station 40 has significant asset condition issues per asset condition report. Major assets need to be replaced in five years (2023): 4.8kV transformer bank and PTs, 4.8kV & 34.5kV switches, buses, bus sporting steel structure and arresters. The third new Sonora Way feeder will transfer the southern portion of Sonora Way F438152 (formerly Lakeville F4063), that will be rebuilt and converted on FP (C051691). This will balance load across Sonora Way feeders and provide capacity to support a Sonora Way tie with Geneseo F5552.
- **Welch 83 – Substation Refurbish D-Line (C046583 and C046584)** - These projects will cover distribution substation and line costs associated with the refurbishment of Welch 83.Formerly called "Welch 83 - Indoor Substation Refurb."
- **Buffalo Station 25 Rebuild – Station (C036456)** - Refurbishment of Buffalo Indoor Substation #25 as per appropriate Asset Strategy and Sanction
- **Buffalo Station 30 Rebuild (C046519 and C015754)** - Refurbishment of Buffalo Indoor Substation #30 as per appropriate Asset Strategy and Sanction. Additionally, this will replace the first section of getaway cables as part of the Buffalo Station 30 rebuild.
- **Buffalo Station 31 Rebuild (C046952 and C046943)** - Refurbishment of Buffalo Indoor Substation #31 as per appropriate Asset Strategy and Sanction. Additionally, this will cover distribution line costs associated with the refurbishment of Buffalo Station 31.
- **Buffalo Station 32 Rebuild – Station (C036459)** - Refurbishment of Buffalo Indoor Substation #32 as per appropriate Asset Strategy and Sanction. This project supports CLCPA per PSC Case 20-E-0197.
- **Buffalo Station 34 Rebuild – Station (C046953)** - Refurbishment of Buffalo Indoor Substation #34 as per appropriate Asset Strategy and Sanction
- **Buffalo Station 35 Rebuild – Station (C046954)** - Refurbishment of Buffalo Indoor Substation #35 as per appropriate Asset Strategy and Sanction
- **Buffalo Station 38 Rebuild – Station (C046955)** - Refurbishment of Buffalo Indoor Substation #38 as per appropriate Asset Strategy and Sanction. This project supports CLCPA per PSC Case 20-E-0197.
- **Buffalo Station 38 Rebuild – Line (C046936)** - This project will cover distribution line costs associated with the refurbishment of Buffalo Station 38.
- **Buffalo Station 41 Rebuild – Station (C046956)** - Refurbishment of Buffalo Indoor Substation #41 as per appropriate Asset Strategy and Sanction
- **Buffalo Station 45 Rebuild (C090725 and C090726)** - Refurbishment of Buffalo Indoor Substation #45 as per appropriate Asset Strategy and Sanction. Additionally, this will replace getaway cables for 4.16KV cables for Buffalo STA 45 Rebuild and to complete Pre-Construction distribution work.
- **Buffalo Station 51 Rebuild (C046958 & C046927)** - Refurbishment of Buffalo Indoor Substation #51 as per appropriate Asset Strategy and Sanction. Additionally, this will replace getaway cables for 4.16KV cables for Buffalo STA 51 Rebuild and to complete Pre-Construction distribution work.
- **Buffalo Station 68 Rebuild – Station (C046946)** - Refurbishment of Buffalo Indoor Substation #68 as per appropriate Asset Strategy and Sanction
- **Buffalo Station 122 Rebuild – Line (CD00779)** - This project will cover distribution line costs associated with the refurbishment of Buffalo Station 122.
- **Ohio St - Buffalo River Tunnel/Bore (C050400)** - Jack & bore under the Buffalo River approximately 400ft. in length at a depth of 40-60ft. in order to install a 48in. casing for a

20-way conduit bank. This is required to tie the "Ohio St - South" project with the "Ohio St - North" project which are tied to the Ohio St DOT road project. _x000D_ Retire cables in the existing tunnel under the Buffalo River owned by the City of Buffalo DPW. The existing tunnels integrity is in question which is being examined by external parties that have experience in this area. The tunnel is 78ft. deep, 400ft. long with approximately 5ft. of headroom. It contains a high-pressure gas line, water main, Ohio St bridge control cables as well as National Grid 23kV and 5kV circuits. The tunnel was built circa 1915 and it's felt that it's not safe human occupation anymore. The electrical scope of work for this project is complete, only the environmental remediation remains.

- **Eighth St 80 - Refurbishment (C046585 and C046586)** - This project will refurbish the existing obsolete 23kV-4.16kV, three 3.5MVA transformers with a single 13.2kV-4.16kV, 9.375MVA transformer. Additionally, this will cover distribution line costs associated with the refurbishment of Station 80. Formerly called "Eighth St 80 - Indoor Substation Rd". It will create new feeder ties, upgrade UG cable getaways, and OH wire to support the refurbishment of Eight St 80.
- **Station 140 Station Rebuild (C056616)** – The project is addressing asset condition and increasing system capacity at the substation.
- **Station 79 Rebuild (C082713)** – This project is addressing asset condition issues and redesign with additional capacity at the substation.
- **Grand Island Station Build (C081485)** - This project is to modernize and increase capacity to Grand Island Station 64's aging devices due to their asset condition.
- **Eleventh St 82 - Indoor Substation (C046582)** – To address safety concerns due to age related issues, this project will construct a new 13.2-4.16kV, 9.375MVA station, with metalclad station switchgear.
- **Newfane 170 Asset Condition (C091765)** – This project is to solve the Asset Condition issues at Newfane 170 TB1. To address this, multiple 34.5/4.8kV padmounted transformers will be constructed to completely offload Newfane 170.
- **Roberts Rd Sta – Replace TB1 (C086985)** – This project is for the replacement of the power transformer with the standard size 115/13.2kV (15/20/25MVA). TB1 is on the transformer watchlist due to asset condition. The new TB1 increases capacity and addresses asset condition.
- **Waterport Asset Condition (C091751)** – To resolve asset condition issues, this project will rebuild or replace (34.5kV/4.8kV) Station due to Asset Condition & Thermal Overload with two new 13.2kV or 4.8kV Padmount Transformers
- **New Franklinville Station (C093616 and C093544)** –These projects will purchase the land and build a new single transformer(115/13.2kV) greenfield distribution substation to add capacity in the Franklinville Area.

MVD Hosting Capacity

The MVD Hosting Capacity strategy includes those projects where major asset refurbishments have been identified coupled with increasing capacity. These projects encompass proactively replacing assets using asset management methodologies coupled with increasing system capacity increases.

Drivers:
The investments in this strategy are driven by The Company's aging infrastructure, risk mitigation and obsolescence of assets and the ever-increasing customer electrification and decarbonization needs to ensure safe and reliable network operation.

Customer Benefits:
The MVD System Capacity strategy can maximize the utilization of existing asset condition projects and planned system capacity needs while avoiding the cost of under-built or otherwise inefficient solutions which only address a single asset condition issue.

2023 to 2024 Variance:
The projected program investment is shown in Table 4-23. The variation year-on-year is due to scope and timing of specific projects in this category. The Multi-Value Distribution – Hosting Capacity program name is new so the variance will be the total amount shifted from the various programs in the asset condition rationale with increased scope.

Table 4-23
Multi-Value Distribution Asset Condition - Hosting Capacity ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	1.9	0.8	0.7	0.1	0.5	4.0

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **Lasher Rd Feeder #52 Conversions (C086787)** - This project will rebuild most of the existing Shore Rd 28185, 4.8kV distribution feeder and convert it to 13.2kV transferring the load to the new Lasher Rd 322152 feeder, moving the Shore Rd 281 substation closer to retirement. In addition, this project will create a feeder tie from the Lasher Rd 322152 feeder to the Ballston 01251 feeder to address a feeder overload condition on the Ballston feeder.

4. F. Reliability

Reliability projects are intended to ensure the electric network has sufficient operability to meet the demands of the system and our customers. Projects in this spending rationale are intended to improve performance of facilities where design standards have changed over time, and to provide appropriate degrees of system configuration flexibility to limit adverse reliability impacts of contingencies. The Company has instituted planning criteria for Customer Interruptions ("CI") and Customer Hours Interrupted ("CHI") at risk following an N-1 contingency that sets CI and CHI exposure thresholds for various supply and feeder contingencies with the purpose of setting a standard for minimum electrical system performance. These thresholds are applied in conjunction with other criteria - such as maintaining acceptable delivery voltage and observing equipment capacity ratings - to ensure the system operates in a reliable manner while managing risk of customer interruptions to an acceptable level.

Analysis of interruptions under these criteria assume that any and all practical means are used to return load to service including use of mobile transformers and field switching via other area supply lines and/or area feeder ties. CHI and CI analysis recognizes the approximate times required to install mobile/back-up equipment as well as stepped field switching, *i.e.*, moving load from the adjoining in-service station with feeder ties, that will be used to pick-up customers experiencing an interruption, to a second adjoining station to increase the capability of the feeder ties. In addition, the expenditures in this rationale are used to install reclosers that limit the customer impact associated with an interruption. It also includes investment to improve performance of the network through the reconfiguration of feeders and the installation of feeder

ties. The projected distribution investment in the reliability spending rationale over the Plan period is shown below.

2023 to 2024 Variance:
The variances between the 2023 and 2024 Plans are shown in Table 4-24 below.

Table 4-24
Reliability Spending Rationale
Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	40.7	38.9	38.2	33.4	28.7	-	179.9
2024	-	46.0	47.7	46.0	48.1	35.4	223.2

The following specific projects are classified as Reliability program and have planned spending in excess of $1 million in any fiscal year. Details on the planned spending profiles for these projects are included in Exhibit 3.

- **Delameter (C046536)** - This project is to install two 20/26/33MVA transformers and to reconfigure the F9352 Layout. The existing station transformer is leaking and violates the 240MWh criteria. The station also has only one tie to an adjacent 13.2kV station (Lakeview).
- **Sorrell Hill Rebuild (C077170)** - This project is to install a second bank at Sorrell Hill to relieve MWh violations at Lysander and Sorrell Hill. This project supports CLCPA per PSC Case 20-E-0197.
- **Corliss Park (C081414)** - This project is for feeder conversion and overhead work on the Corliss Park 33817 feeder.
- **Long Rd 209 (CD00977 and CD00964)** - These projects are to install a transformer and new feeder to resolve MWh violations at Long Rd.
- **Mohican Getaways (C081399)** - Mohican Station Feeder Getaways Civil, Cable, Riser Poles, and Feeder voltage upgrades to support new 13.2kV metal-clad at Mohican Station. Also includes Henry St. network feeder, Ogden Brook 52 Getaway and OH, and Ogden Brook 55 Henry St load transfer.
- **Baker St – Install 2nd Transformer (C046553)** - This project will provide for a new second transformer at Baker St substation in Busti, NY to alleviate MWh violations.
- **McIntyre-Hammond #24 Dist. Taps (C083853)** - This project will relocate several miles of the McIntyre-Hammond #24 line out of a swamp area.
- **Mumford Station 50 (C046590)** - This project is to installs a second transformer and a new feeder to resolve MWh violations at Mumford Station.
- **Byron F1863 – Rebuild/Reconductor (C049762)** - Rebuild/Reconductor portion of Byron F1863 with small conductor on North Byron Rd and Byron Holley Rd. Approx. 2.6 miles of #6A CCW conductor to be replaced with 336 AAC to improve tie capability with F2062.
- **Chrisler Ave 25735 Conversion (C057133)** - Convert all mainline Chrisler 25735 from 4.16kV to 13.2kV. Convert Emmet 25605 West of I-890 from 4.16kV to 13.2kV. Then reallocate all load to Weaver 24551 - transferring ~ 1.3MVA.
- **New Krumkill 42154 (C091181)** – Construct a new 13.2kV feeder 42154 out of the Krumkill 421 substation to temporarily feed the New Krumkill 42126 and 42127 feeders as well as the Vista Tech Park by connecting to the 42152 feeder and its ongoing construction under project C083928.This new 42154 feeder will eventually become a Vista Tech Park dedicated 13.2kV feeder.

- **CLCPA St Johnsville 51-Salisbury 53 (C091830)** - Build and automate a 13.2kV feeder tie between the St. Johnsville 33551 and Salisbury 67853 feeders by constructing about five miles of 13.2kV distribution along State Highway 5S. This project will reduce the load at risk during Phase 1 construction of the CLCPA transmission project. This project supports CLCPA per PSC Case 20-E-0197 by creating the distribution feeder ties needed to reduce the load at risk during the construction of transmission level CLCPA projects.
- **CLCPA St Johnsville 54 - Inghams 51 (C091831)** - Build and automate a 13.2kV feeder tie between the St. Johnsville 33554 and Inghams 02051 feeders by constructing about six miles of 13.2kV distribution along State Highway 5, Snells Bush Rd, and Inghams Mills Rd. This project will reduce the load at risk during Phase 1 construction of the CLCPA transmission project. This project supports CLCPA per PSC Case 20-E-0197 by creating the distribution feeder ties needed to reduce the load at risk during the construction of transmission level CLCPA projects.
- **CLCPA Clinton 54 to Temporary Substation (C091832)** - Build and automate a 13.2kV feeder tie between the Clinton 36654 and a temporary substation built near the Marshville substation by constructing about two miles of 13.2kV distribution along State Highway 10 and Fredericks St. This project will reduce the load at risk during Phase 1 construction of the CLCPA transmission project. This project supports CLCPA per PSC Case 20-E-0197 by creating the distribution feeder ties needed to reduce the load at risk during the construction of transmission level CLCPA projects.
- **CLCPA Marshville Temporary Substation (C091833)** - Construct a temporary 69/13.2kV distribution substation adjacent to the Marshville substation. This project will provide a back-up source for the Clinton 366 substation during Phase 1 construction of the CLCPA transmission project. This project supports CLCPA per PSC Case 20-E-0197 by creating the distribution feeder ties needed to reduce the load at risk during the construction of transmission level CLCPA projects.
- **Stoner 53 – 477 to County Highway 107 (C091771)** - We have experienced multiple station breaker lockouts on County Highways 142 and 142a due to numerous conductor failures. There are now a minimum of 56 splices in this section of distribution and an infrared study has found multiple hot spots, some at splices and others just within the conductor itself. Since the area of concern is at the beginning of the feeder which primarily serves large industrial and commercial customers and will be serving the Vireo Health facility later this year, it is necessary to replace this section of conductor to prevent future outages due to conductor failure. This project calls to reconductor the Stoner 35853 from the station riser pole about 12,400’ to the intersection of County Hwy. 107 with 477 bare conductor.
- **Unionville 52 - Convert Delmar 27941 (C089575)** - The Delmar 279 substation has been identified as having considerable asset condition issues. A major project is in the planning process to retire the Delmar substation to rebuild the adjacent Elsmere 407 substation to a 34.5kV/13.2kV configuration with one 20 MVA transformer and one metalclad capable of serving 3 feeders that will include both the Delmar 279 and Elsmere 407 load. While the major project is proceeding through the design and approval process, it is imperative that the conversion of the Delmar distribution feeders begin in parallel, and the load be transferred to adjacent substations where possible to reduce the reliability impact of a catastrophic failure at Delmar 279, should it occur before the Delmar Substation rebuild being completed. This project calls to rebuild the three-phase mainline of the Delmar 29741 as necessary to transfer its load to the adjacent Unionville 27652 feeder.
- **Yahnundasis - Oneida Tie Part 1 (C092395)** - Create a new tie between Yahnundasis 56 and Oneida 53 feeders along NY-5 (Seneca Turnpike). In total, ~1.8 miles of three-phase conversion from 4.16kV to 13.2kV and an additional ~0.75 miles of single-phase 4.16kV to

three-phase 13.2kV conversion. Additional line work included for new ratio transformers on large 4.16kV side taps and regulator upgrades to support tie capacity.

- **Convert Louisiana St from OH to UG (C093590)** - This project is part of an initiative to convert selected feeders from exiting overhead to an underground system to improve reliability performance. This area is of particular interest to political representatives as result of the 2022 blizzard. Construct approx. 6500ft. of 9-5in. mainline duct bank and install approx. 10,000ft. of mainline UG feeder. Also, construct approx. 3400ft. of URD style system to enable transfer of their services to an UG supply so the OH facilities can be removed.
- **Targeted UG Grooms Rd Tie (C093862)** - The Grooms Rd 34553 rises up on Ray Rd for only a few sections to create OH field ties to the Grooms Rd 34554 and the Grooms Rd 34558. The location that this UG to OH transition occurs is in an area where there are a lot of trees, and over the past several years there have been tree related outages in this area that have locked out the feeder breaker impacting the 1,756 customers fed from the Grooms Rd 34553. The project being proposed is to move those overhead conductor and switches associated with the field ties to underground. The underground setup will include: 4,500' of underground cable and conduit, a four-position dead front switchgear, and two riser poles with normally open vertically mounted hook-stick disconnects allowing the Grooms 34553 to tie to the Grooms 34554 and Grooms 34558 through underground facilities and removing the risk of tree related outage at the feeder head.
- **Convert F3462 & 3465 to Underground (C093555)** - Support Initiative to migrate to a fully UG Distribution System. Install 5500ft. of mainline 9-5in. duct bank, 6200ft. of mainline feeder cable and 32,500ft. of URD facilities.
- **Patroon Construct New Feeders (C081583)** - Construct three new 13.2kV distribution feeders out of the Patroon Substation to connect to the new second bank and metalclad.
- **South Oswego - Whitaker Resiliency (C090776)** -This project at Whittaker Sub will install a new motor operator for tie switch 8106 and new load break bottles for switches 44 and 8106. Install new line CCVTs and a new transmission line sectionalizing scheme.

Engineering Reliability Review:

An Engineering Reliability Review ("ERR") can be completed for any feeder experiencing reliability problems or any localized pocket of poor performance. ERRs are often performed on those feeders defined as Worst Performing Feeders ("WPF") as described in the Electric Service Reliability Report, filed annually in accordance with Case 90-E-1119. The scope of an ERR typically involves:

- Review of one-year and multi-year historical reliability data to identify issues and/or trends.
- Review of recently completed and/or planned work expected to impact reliability.
- Review of the need for installation of radial and/or loop scheme reclosers.
- Review for additional line fuses to improve feeder sectionalization.
- Review of the coordination of protective devices to ensure proper operation.
- Review for equipment in poor condition.
- Review of heavily loaded equipment.
- Review for other feeder improvements such as fault indicators, feeder ties, capacitor banks, load balancing, additional switches, and reconductoring (overhead and/or underground).

Drivers:
ERR recommendations are used to improve reliability on circuits experiencing recent poor reliability performance.

Customer Benefits:
The ERR program improves customer reliability in areas where performance has been substandard. ERR work also helps harden the feeder to make it more resilient.

2023 to 2024 Variance:
Projects associated with the ERR program are reactionary and are identified as reliability concerns arise. As such, specific projects are only identified in the early years of the plan. A future spending plan is created and reviewed annually to target priority projects. The planned spend for the ERR program has been reduced to accommodate higher priority projects for the next several years.

Table 4-25
Engineering Reliability Review Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	1.6	0.4	0.4	0.0	3.1	-	5.5
2024	-	0.2	1.8	0.0	0.9	0.0	2.9

The following specific projects are classified as Engineering Reliability Review program and have planned spending in excess of $1 million in any fiscal year.

- **Chrisler Ave 25735 Conversion (C057133)** - Convert all of mainline Chrisler 25735 from 4.16kV to 13.2kV. Convert the Emmet 25605 feeder west of I-890 from 4.16kV to 13.2kV then reallocate all load to the Weaver 24551 feeder - transferring ~1.3MVA.

Storm Hardening:

The Storm Hardening program increases the resilience of the distribution system in areas that have experienced repeated outages during adverse weather to improve reliability performance and customer satisfaction. Minor Storm Hardening ("MSH") projects include moving pole lines to the road, review of pole size, class, and use of Grade B construction at critical poles (*i.e.*, junction poles, switch poles and road/rail/water crossings), additional sectionalizing points (*i.e.*, reclosers, fuses and switches), enhanced lightning protection, and enhanced vegetation management.

Drivers:
Storm Hardening recommendations are utilized as a basis to improve reliability in targeted areas that have experienced poor performance during adverse weather events.

Customer Benefits:
The Storm Hardening program will enhance distribution resiliency in targeted areas.

2023 to 2024 Variance:
The projected investment and the variation between the 2023 and 2024 Plans are shown in Table 4-26 below. Variance is due to improved project scopes and estimates due to the analysis performed on the circuits identified for the program. The forecast decrease is due primarily to the fact that one of the three projects currently under this program (C057386 - Battenkill 57-FY17 Storm Hardening) is under construction in FY24 and will have a majority of its spend take place in that FY. The remaining two projects shifted to FY26 due to priority changes in the plan.

Table 4-26
Storm Hardening Review Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.4	0.5	0.0	0.0	0.0	-	0.9
2024	-	0.1	0.5	0.0	0.0	0.0	0.6

There are no specific projects in this category forecasted with planned spending in excess of $1 million in any fiscal year.

Substation Flood Mitigation:

Major flood events, floodwater heights associated with such events, and specific time and location of events are inherently difficult to predict. Extensive research, analysis, examination of historical events, and Federal Emergency Management Agency ("FEMA") flood maps have been used to assess risks and facilitate the substation flood mitigation program.

Under National Grid's Distribution Substation Flood Mitigation Program, substantial investment has occurred in recent years to mitigate flood risk and increase substation resiliency in accordance with FEMA recommendations and sound engineering practices. Mitigation efforts have included raising the height of vulnerable equipment, constructing barrier floodwalls surrounding substations, relocating substations out of flood zones, and purchasing emergency flood deployment materials. Flood risks are examined with each project scope of work to improve flood mitigation when feasible.

Drivers:
Severe storms and flooding have highlighted the potential vulnerability of substations. Several recent events in the Company's service territory have exceeded FEMA's 100-year flood height elevation and are a driving force for the program.

Customer Benefits:
Reliable power to communities during a flood event is critical and has the potential to preserve extensive real and personal property (*i.e.*, individual customers' sump-pump systems, *etc.*).

2023 to 2024 Variance:
The projected investment is shown in Table 4-27 below. This is a new program as part of the Climate Change Vulnerability Study and Resilience Plan, and the planned investment has remained the same since the program was created in the 2023 CIP.

Table 4-27
Substation Flood Mitigation Program Variance ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.0	0.1	0.2	0.0	0.0	-	0.3
2024	-	0.0	0.1	0.2	0.0	0.0	0.3

4. G. Resiliency

Resiliency projects are intended to allow the electric power system to anticipate extraordinary, high-impact, low-probability events and rapidly recover from these disruptive events. Historically,

reliability and resiliency projects were detailed under the Reliability spending rationale; however, National Grid recognizes the importance of highlighting Resiliency as its own category with system recovery and survivability as its core concepts. System recovery refers to the use of tools and techniques to quickly restore service to as many affected customers as practical. Survivability refers to the enhanced system planning or use of innovative technologies to aid customers, communities, and institutions in continuing some level of normal function without limited access to the grid. The main programs within this rationale are FLISR, distribution line sensors/monitors, targeted feeder ties, and climate change vulnerability.

FLISR is a method of installing switching devices to limit the customer impact associated with an interruption by automatically reconfiguring a feeder without the intervention of personnel to bring customers back on-line. Distribution line sensors/monitors provide greater insight into the real-time operation of the electric power system so that circuit capabilities can be maximized in a cost-effective way and reduce the likelihood of a potential emergency response. Targeted feeder tie installations create additional opportunities to quickly recover service to customers affected by an event.

2023 to 2024 Variance:
The variances between the 2023 and 2024 Plans are shown in Table 4-28 below. The Resiliency spending rationale was created in 2020.

Table 4-28
Resiliency Spending Rationale
Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	21.4	22.0	101.2	200.8	181.9	-	527.3
2024	-	21.2	84.9	99.9	186.2	195.6	587.8

FLISR:

Traditional distribution design utilizes several types of sectionalizing devices. For radial distribution feeders, there is typically a three-phase breaker at the substation, which acts as the primary disconnecting means for the whole feeder. From the substation, there are three-phase reclosers and switches which are used to sectionalize the mainline of the feeder. Three-phase reclosers are designed to autonomously interrupt fault currents and isolate the faulted area of the feeder following a contingency event. Restoration of non-faulted segments of the feeder are generally performed through the manual operation of field switches.

In the event of a fault, traditionally implemented distribution systems will attempt to isolate the faulted section of the feeder through the fuse, recloser, or breaker protection capabilities. Once isolated, crews will manually find the fault, isolate, and then reconfigure the circuit using switches and feeder ties (in addition to reclosers and fuses). This ‘human in the loop’ method of service restoration necessarily takes time to implement, which results in additional customers interrupted and customer minutes interrupted (“CMI”) as compared to a system where the field devices are automated.

As part of the FLISR program, all new and existing reclosers will be integrated with D-SCADA to allow control center operators to monitor and control the devices remotely. For lateral taps off the mainline, fuses and manual switches will be used for sectionalization without remote monitoring or control capability.

Similarly, for contingency and maintenance purposes, "feeder ties" will be created where feasible. These feeder ties generally employ manual switches that are normally left in the open position.

Drivers:
FLISR is a control scheme which incorporates telecommunications and advanced capability of key switching devices to provide remote monitoring and operator control of field devices for normal operations and maintenance. At the same time, FLISR provides an automated response to system contingencies for minimizing customer interruptions and expediting system reconfiguration to facilitate service restoration. This greatly impacts the resulting customers interrupted and CMI performance from a fault event that occurs within a zone of protection. As part of a FLISR system, manual switches and feeder ties would be upgraded to automated switches (*i.e.*, reclosers) at three-phase mainline locations. In addition, these devices would be integrated with the Company's D-SCADA system and the future ADMS.

The Distribution Line FLISR program development began in FY20 and has deployed ten schemes through FY23, with 12 additional schemes under construction through FY24. In FY25 and beyond, the Company will continue to deploy and activate these schemes in high-value locations across the Company's NY Electric service territory.

Customer Benefits:
National Grid anticipates improved main line CMI performance for feeders targeted for FLISR deployment. The additional operational data collected by the automated reclosers will also support the improved management of the distribution system and assist in demand optimization, DER integration, and operational efficiency.

2023 to 2024 Variance:
The projected investment is shown in Table 4-29 below. National Grid is ramping up deployment of FLISR and expects to continue statewide deployment on selected circuits after an acceleration effort in the areas of reliability and resiliency by shifting dollars from other programs such as VVO/CVR.

Table 4-29
FLISR Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	11.4	11.4	21.0	21.0	30.5	-	95.3
2024	-	12.3	38.9	39.6	39.6	38.9	169.3

The following programs are classified as FLISR and have planned spending in excess of $1 million in any fiscal year. Details on the planned spending profiles for these programs are included in Exhibit 3.

- **NY FLISR – D line (C080089 – NYE, C080088 - NYC, C080090 - NYW)** - These projects will cover the deployment of the NY FLISR program across the Company's service territory. These project supports CLCPA per PSC Case 20-E-0197.

Targeted Feeder Tie Enhancement:

This program is intended to create new high-value feeder ties. New feeder ties are established to make substations/feeders more resilient and to remove the need for a mobile substation by bolstering feeder capability. In case of an outage, feeder ties are used to reconfigure the system for rapid customer restoration. During a station interruption, the installation of a mobile substation

can often take multiple hours leaving customers out of service, as ample feeder tie capacity does not exist. Targeted feeder ties can eliminate the need to deploy a mobile substation by establishing adequate feeder capabilities to offload an entire interrupted station to adjacent stations via ties.

Drivers:
Feeder enhancements are used to improve resiliency in targeted areas by improving contingency response and recovery.
Customer Benefits:
National Grid anticipates improved restoration times for future outages in targeted areas.

2023 to 2024 Variance:
The variances between the 2023 and 2024 Plans are shown in Table 4-30 below. The Plan includes new programs, specifics projects, and reserves for resiliency, climate vulnerability and targeted undergrounding feeders.

Table 4-30
Targeted Feeder Tie Enhancement Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	6.2	6.3	47.2	103.5	115.0	-	278.3
2024	-	6.8	14.7	10.8	19.6	18.3	70.1

The following specific projects are classified as Targeted Feeder Tie Enhancements and have planned spending in excess of $1 million in any fiscal year.

East

- **Firehouse Rd Station – New Feeder (C050081)** - This project involves the utilization of a spare breaker at the Firehouse 449 substation. The company will install ~2,400' of UG duct bank with 1000 MCM CU from that spare breaker alongside our existing Firehouse 44952 underground getaway. A reconductoring and conversion of ~1,950’ of existing overhead distribution on Woodin Road will also be completed. Doing this project will create a new open tie between the Firehouse 44952 and the Firehouse 44951 on Woodin Road.
- **East Worcester 18924 Feeder Tie (C094409)** – This project is to extend 6,000’ of three-phase and build 3,000’ of new distribution line on the Worcester 18924 to create the feeder tie between Worcester 18924 and East Worcester 06021 feeders.

Central

- **Milton Ave D-Line (C046643)** - This project is to address a CHI at Risk violation at the Milton Ave Substation and the associated feeders.
- **Rock City Station 623 – Transformer (C046671)** - This project provides for the replacement of one power transformer and rebuild/conversion of the substation to 13.2kV.
- **Feeder Tie Gilbert Mills – New Haven (C094367)** – Construction Phase 1 - Rebuild/Convert ~0.75 miles of single-phase 4.8kV to 13.2kV three-phase, install one regulator, install two three-phase ratios, install one single-phase ratio. Construction Phase 2 - Build new 0.2 miles of 13.2kV three-phase conductor, Rebuild/Convert 0.65 miles of single-phase 4.8kV to 13.2kV three-phase, install one single-phase ratio, install one regulator, install one recloser.

- **New Thousand Islands 81457 Feeder (C081805)** - This project will construct a new feeder using the existing spare feeder position at the Thousand Islands substation. The addition of this feeder will create ties between multiple feeders in the area.
- **Rock City Sub - Distribution Line (C082291)** – This project relocates four distribution poles outside of Rock City Substation and building ties between the Rock City Feeders. Three Padmount transformers will be installed to step down the new 13.2kV feeder getaways to the 4.16kV Feeder voltage.
- **North Shore Study (C091758)** – Upgrade transformers convert feeders at a number of stations on the north shore of Oneida Lake.
- **Lehigh 53/Rome 54 Tie Recon. P1 (C094422)** – This project includes reconductoring, adding neutral and converting ~1.4 Miles from 12kV ratio transformer towards Rome 54 along Herder Rd.

West

- **Rebuild/Convert to Create Tie Shelby F7652-7651 (C049802)** - This project creates a full 13.2kV tie on the outer extremities of these feeders in area that currently have very limited tie capabilities due to ratio transformers in the main line feeder.
- **Create Full Tie Lakeview Rd F18251 to F18254 (C049882)** - This project converts & rebuilds approximately 5000ft. of circuit on Old Lake Shore Rd. Can eliminate two main line ratios and create a full feeder tie between F18251 and F18254.
- **Feeder 03_17063 Tie with Feeder 17163 (C094411)** – This project is to create a feeder tie for 17161 with 17063.
- **Feeder North LeRoy 04_0456 Tie with Mumford Feeder 5053 (C094406)** – This project is to rebuild & convert ~3.3 miles (17,400ft.) of North Leroy F0456 to create feeder ties with Mumford F5053.
- **Feeder 05_5051 Tie with Feeder 5053 (C094388)** – This project is to rebuild & convert ~4.3 miles (22,900ft.) and extend ~one mile (5,400ft.) of Mumford F5051 to create two feeder ties with Mumford F5053.
- **Feeder Lyndonville 06_9561 Tie with Feeder Barker 06_7863 (C094382)** – This project is to create a feeder tie for F9561 with F7863.
- **Feeder Berry Rd 08_15351 Tie with Berry Road Feeder 15353 (C094407)** – Feeder 15351 Tie with 15353 on Swede Rd-Convert to make new Tie (2.2 miles of 4.8kV to 13.2kV conversion)
- **Middleport F7765 Tie w/ Shelby 7656 (C049711)** - This project creates a ratio feeder tie with Shelby Feeder 7656 on Telegraph / Maple Ridge Rd would increase reliability and provide the ability for load transfers and operational flexibility during outage restoration and maintenance. This project supports CLCPA per PSC Case 20-E-0197.
- **Rebuild/Convert to Create Tie Shelby F7652-7651 (C049802)** - This project creates a full 13.2kV tie on the outer extremities of these feeders in area that currently have very limited tie capabilities due to ratio transformers in the main line feeder.
- **Create Full Tie Lakeview Rd F18251 to F18254 (C049882)** - This project converts & rebuilds approximately 5000ft. of circuit on Old Lake Shore Rd. Can eliminate two main line ratios and create a full feeder tie between F18251 and F18254.

Microgrid:

This program under the Resiliency spending rationale is comprised of system upgrades required to support islanding functionality (i.e., a microgrid).

Drivers:
Islanding capability in remote regions of the Company's service territory allows customers to experience improved reliability. Customers in these regions experience longer and more frequent outages due to their radial nature. During an outage, islanding several substations with the support of an interconnected Energy Storage System (or other generation) can help minimize or eliminate interruption times.

Customer Benefits:
Microgrids will support regions that experience frequent outages to improve reliability and decrease outage frequency and duration. The interconnection of an Energy Storage System (ESS) to accomplish this would also be supporting the State's CLCPA energy storage goals.

2023 to 2024 Variance:
The projected investment is shown in Table 4-31 below. The Energy Storage Order Upgrades have increased the scope of work since the 2023 and spending from 2023 to 2024 has increased due to the Ticonderoga Battery Energy Storage System ("BESS") project included in this year's Plan.

Table 4- 31
Microgrid Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.2	2.5	30.0	73.6	33.6	-	140.0
2024	-	1.9	17.8	22.5	80.0	91.5	213.6

The following project is classified as a Microgrid project and has planned spending in excess of $1 million in any fiscal year.

- **Energy Storage Order Upgrades (C085964)** – This project requires system upgrades to allow the operation of an ESS-sourced island in the town of Raquette Lake. Customers' interruption time will decrease significantly, improving resiliency and reliability in the remote area of the Company's service territory. This project supports CLCPA per PSC Case 20-E-0197.
- **Ticonderoga BESS (C091920)** - This project requires implementation of battery storage based microgrids and other system upgrades to allow for the operation of individual BESS at the substations fed by the radial Ticonderoga Transmission Line (Otten, Hague Rd, Crown Point, and Port Henry Substations) and BESS deployed along the distribution feeders to mitigate customers outages caused by interruptions on the radial Ticonderoga 115kV transmission line and / or distribution level disturbances. Customer interruption time will decrease significantly, improving resiliency and reliability in the remote area of the Company's service territory. In April 2024, the Company will apply to the Department of Energy (DOE) for Infrastructure Investment and Job Act (IIJA) funding for up to $100M to offset the project development costs (i.e. the capital costs in this plan do not include the $100M of DOE support). The project is contingent on this DOE support, which will be applied to the projected total project cost of ~$300M.
- **Gilmantown Energy Storage (C084937)** - This project will supply power to the Gilmantown substation to mitigate a supply loss of the 23kV sub-transmission lines that supply the station. This will improve reliability in the area by reducing outages experienced by customers on the station's feeders that are frequently on the worst performing feeders list. This project supports CLCPA per PSC Case 20-E-0197.

Climate Vulnerability

In 2023, the Company completed a Climate Change Vulnerability Study and Resilience Plan to understand the impact future climate hazard projections would have on transmission and distribution assets and design standards and how to adapt to the impacts of climate change. The priority climate hazards identified for distribution assets were high temperature, wind, ice, and flooding. These priority climate hazards were chosen based on temperature data from Columbia University and NYSERDA, wind and icing data that was provided by MIT, and flood risk data from the Company's Climate Change Risk Tool and FEMA flood risk designation. The projects below were chosen to upgrade assets and better withstand increased intensity and frequency extreme weather events.

Drivers:
As a result of the Climate Change Vulnerability Study ("CCVS"), the below projects were recommended as part of the Climate Change Resilience Plan ("CCRP") to adapt to a projected increase in frequency and intensity of climate hazards across distribution service territory. From the Study and Plan, it was determined distribution assets may be exposed and vulnerable to high temperatures, extreme wind gusts, icing, and flooding.

Customer Benefits:
These projects will strengthen distribution structures, underground facilities, and conduct flood mitigation.

2023 to 2024 Variance:
These projects were not in the 2023 Plan.

Table 4-32
Climate Vulnerability Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	-	13.5	27.0	47.0	46.9	134.4

The following specific projects and programs are expected to exceed $1 million in any fiscal year:

- **Distribution Line CCRP Projects (C094132 – NYE, C094130- NYC, C094133- NYW)** - To better maintain resilience during wind and icing events, future pole additions or replacements will use larger Class 1 poles (rather than Class 3 poles typically used today) for three-phase mainline areas as well as for poles carrying significant equipment such as regulators, capacitor banks, and ratio transformers. Approximately 8,000 distribution poles will be affected by this design standard upgrade.
- **Targeted UG CCRP Projects (C094140 - NYE, C094138 - NYC, C094141 - NYW)** - To better maintain resilience in areas that are projected to experience 50mph wind gusts and 0.75in. of radial icing, this program will target three-phase mainline sections of distribution feeders that should be undergrounded. Approximately two miles of overhead distribution feeders will be replaced with underground construction each year.
- **CCRP (Flood) Peterboro 514-Flood Wall (C093813)** - Install flood walls at the Peterboro station to prevent damage to critical assets and allow the substation to stay in service during flooding events.

- **CCRP (Flood) Gloversville Station 72 (C093814)** - Install flood walls around the Gloversville substation to prevent damage to critical assets and allow the substation to stay in service during flooding events.

4. H. Communications / Control Systems

Communications and Control Systems projects ensure that the proper communications equipment is in place to modernize and efficiently operate the electric system. Projects in this spending rationale include monitoring and communications infrastructure for Company equipment and customer metering. These projects enhance automation and allow for better visibility of the operation of the electric system.

Drivers:
Communications and control systems allow for remote status monitoring and control of assets.

Customer Benefits:
The communications and control systems installations and upgrades will lead to the automation and modernization of electric system infrastructure to improve performance and reliability.

2023 to 2024 Variance:
The projected investment is shown in Table 4-33 below. The forecast has decreased based primarily on the change in spending rationale for the AMI program.

Table 4-33
Communications / Control Systems Spending Rational Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	30.1	35.9	36.1	35.6	34.9	-	172.6
2024	-	36.4	47.3	51.0	57.6	62.3	254.6

Remote Terminal Unit ("RTU")

This strategy covers the addition or upgrade of RTUs and related infrastructure at substations presently lacking remote monitoring and control capabilities. RTUs in substations communicate with the Energy Management System ("EMS") and leverage substation data to provide operational intelligence. This significantly reduces response time to abnormal conditions.

There is an additional investment to replace outdated RTUs based on asset condition. That investment is documented in the Asset Condition spending rationale section.

Drivers:
RTUs will allow for remote operation and management of the system at stations providing benefits in contingency response and recovery.

Customer Benefits:
This strategy leverages operational intelligence to reduce response time to abnormal conditions through real-time monitoring and control. The strategy also enables distribution automation, sub-transmission automation, and future modernization strategies to improve service to customers.

2023 to 2024 Variance:
The projected investment is shown in Table 4-34 below. The spending has been modified based on further development of the plan for each substation.

Table 4-34
Substation RTU program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	7.9	7.7	15.0	15.0	15.0	-	60.6
2024	-	4.8	15.2	15.2	15.4	14.9	65.5

The following programs are expected to exceed $1 million in any fiscal year:

- **EMS/RTU Installs (C076123 - NYE, C076124- NYC, C076125 - NYW)** - These programs are to install new RTUs or expand the existing EMS at a substation for the purpose of system modernization. These project supports CLCPA per PSC Case 20-E-0197.
- **EMS/RTU for Distribution Supervisory Control and Data Acquisition ("DSCADA") (C077972)** - This project is for the upgrade of existing RTUs at stations with both distribution and transmission voltages to make-ready for ADMS. To accomplish this, a second SCADA network will be operated through a separate port on the RTU. Older RTUs that cannot be dual ported will be upgraded or replaced. This project supports CLCPA per PSC Case 20-E-0197.

Substation Communications Expansion (Telecom):
This strategy upgrades and extends the statewide substation communications network. It provides private fiber connectivity to several larger stations and new public or private communications capability to stations that currently have no connection.

Drivers:
Through expanding its fiber network, the Company can increase its capacity and decrease the need for public telecommunications provider services by lowering the cost and complexity of deploying substation automation and distribution system technologies. This strategy directly supports the EMS RTU expansion proposed above by providing data backhaul for advanced metering system deployments and demand response messaging.

Customer Benefits:
Customers benefit through the reduction in on-going telecommunications costs and more utility control of operations, maintenance, troubleshooting, and repair resulting in improved reliability and security.

2023 to 2024 Variance:
The projected investment is shown in the table below.

Table 4-35
Telecom program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	15.2	16.1	20.5	20.2	19.9	-	92.0
2024	-	17.9	31.2	35.3	42.2	47.4	174.0

The following programs are expected to exceed $1 million in any fiscal year:

- **EMS/RTU Telecom (C076107- NYE, C076108 - NYC, C076110 - NYW)** - These programs are to support the EMS/RTU Stations Programs above by installing or upgrading the communication line to a station when required for new equipment. These project supports CLCPA per PSC Case 20-E-0197.
- **Telecom Distribution Dark Fiber (C091326 - NYE, C091330 - NYC, C091331 - MYW)** – These programs procure Indefeasible Rights to Use (IRUs) to dedicated fiber optic strands to support the migration away from leased communications circuits and to meet demands of grid modernization initiatives.
- **Telecom and Radio Equipment (C004157)** – This program maintains and upgrades equipment at National Grid's land mobile radio tower sites, which are important communications tools for storm restoration and blue-sky field operations. Component failure, obsolescence and storm damage have contributed to the wear and tear on the system. Replacements and upgrades are required and prioritized annually to keep the system functioning as designed and maintain the reliability of voice communications for National Grid field personnel.

Operational Telecommunications ("OpTel"):

Considering the breadth of communications options and the evolution of technology, the Company understands that a flexible strategy is required when deploying communication systems. In particular, the OpTel system must be designed in a fashion that permits an efficient refresh of network technologies.

The majority of OpTel Strategy costs are to build and operate a private network, which will provide most communications for the new distribution devices such as those supporting DER. A key driver of this change is to reduce long-term costs (e.g., commercial cellular real-time-bidding costs) that increase with each new grid device added to the system.

Drivers:
The Verizon Enterprise Service Contract with National Grid for DS0 (Analog and Digital 56K) service has switched over to an off-tariff rate schedule resulting in substantial increases in the Monthly Recurring Cost (MRC) per circuit. Verizon is also currently decommissioning those circuits on an accelerated schedule and as they provide critical infrastructure protection, the company must transition to new technologies to avoid any service interruptions. As a result, the Company is making efforts to replace existing DS0 circuits with a combination of leased dark fiber through Competitive Local Exchange Carriers (CLEC), DS1 service over MPLS on Verizon Fiber, National Grid Private Fiber optic cable, and National Grid Private microwave. By proactively responding, the Company will lead its network redesign and leverage on-going efforts to reduce costs.

Another key driver behind OpTel work is that multiple types of assets are also reaching the end of their service life and require replacement, such as obsolete DMX or microwave equipment. Grid Modernization demands will be putting more services on the network such as Distributed Generation, Advanced Metering Initiative, Advanced Distribution Monitoring System, Fault Location, Isolation, and Service Restoration ("FLISR"), etc.

Customer Benefits:
Telecommunications provide highly reliable connectivity under both normal and degraded system operating conditions. Operational Telecommunications functionality is a foundational element and supports all other key functionalities.

Specific benefits identified in the OpTel strategy include:

- Operational savings as leased lines are replaced with technology that is more robust and flexible.
- Creates a secure and reliable network for EMS / SCADA, relay protection, and radio.
- Operational efficiency and overall cost reduction gained from combining disparate legacy telecommunications systems.
- Increased reliability of advanced field devices due to network reliability, flexibility, and scalability, especially where high availability and lower latency are required for devices to function properly.

2023 to 2024 Variance:
The projected investment is shown in Table 4-36 below.

Table 4-36
OpTel Program Variance Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	7.4	6.9	9.2	9.0	9.0	-	41.5
2024	-	9.7	16.1	19.0	24.7	29.1	98.5

The following programs are expected to exceed $1 million in any fiscal year:

- **Verizon DS0 Replacement (DSCADA) (C084929 - NYE, C084926 - NYC, C088463 - NYW)** - These programs proactively transfer communications away from leased analog DS0 circuits before their service is decommissioned by utilities like Verizon. These circuits are critical for Energy Management System, system protections, IT, and data telemetry functions. These project supports CLCPA per PSC Case 20-E-0197.
- **OpTel – Data Multiplexer ("DMX") Replacement (C084927 - NYE, C088464 - NYC, C088470- NYW)** – These programs replace existing Nokia (formerly Alcatel-Lucent) DMX Synchronous Optical Network ("SONET") equipment, which is obsolete and reaching their end of life. This project supports CLCPA per PSC Case 20-E-0197 and allows all equipment on the company fiber backbone networks to operate on a packet-based technology, dramatically increasing capacity/flexibility and allowing scalability.
- **OpTel – Dense Wavelength Division Multiplexing ("DWDM") (C088747 - NYE, C088717 - NYC, C0887180 - NYW)** – These programs upgrade the Nokia Dense DWDM equipment, 1830 Photonic Services Switch ("PSS") to accommodate increased network traffic and to support DMX replacements.
- **Distribution Microwave Network (C094104 - NYE, C094105 - NYC, C094106 - NYW)** – These programs rebuild, upgrade, and expand National Grid's private microwave communication network, which handles critical communications for Company assets that do not have terrestrial-based fiber connectivity or that require redundant paths. Existing Harris-Constellation microwave equipment must be replaced as they are nearing end-of-life with limited replacement parts available. Additionally, the microwave network is expected to expand to accommodate the migration away from leased communications circuits and to meet demands of grid modernization initiatives.
- **Distribution Satellite Network (C094111 - NYE, C094110 - NYC, C094112 - NYW)** – These programs will develop, deploy, and maintain a private satellite network, to quickly establish new communication links to substations, AMI collectors, and other remote equipment in areas with limited cell and fiber connectivity and line-of-sight propagation.

4. I. DER – Electric System Access

The DER Electric System Access rationale is used to capture work where the Company will be supporting items such as DG interconnections, storage, non-wires alternatives, and other third-party and market-driven needs. Distributed generation interconnections generally are reimbursable and therefore have little effect on net program spending. This spending rationale also includes projects that are non-reimbursable by the customer, such as farm digester projects; however, no such project is included in the plan horizon.

Drivers:
DER Interconnection and deployment of both third party and company owned assets is the main driver of projects under this program. The Company considers storage projects as non-wires alternatives, or as direct solutions where there is no feasible 'wires alternative'. Storage projects also advance the Company's strategy to support the State's CLCPA goals. The Company seeks to gain further experience in the areas of operation, coordination, and dispatch of energy storage facilities to support safe and reliable operation of the electric distribution system. DER assets, such as storage, can be used to meet planning needs such as system capacity, reliability, and ancillary grid services. For example, the Kenmore Station 22 Energy Storage Project is scoped to provide load relief to the associated station and cable groups that supply it due to limited spacing and timeframe of constructing a traditional asset. There are limited feasible alternatives within the timeframe to improve local load constraints, so a BESS has been proposed to meet the need.

Customer Benefits:
This program animates the energy storage market through attracting storage developers and suppliers to bid on opportunities identified by the Company where storage could provide significant local and system-wide benefits, such as deferral of system capacity upgrades, improved system reliability, and system-wide peak load reduction. Additionally, the storage will provide benefits to customers either in the form of direct resiliency improvement or through deferral of a potentially costly 'wires' alternative.

Storage projects also advance the Company's strategy to support the State's CLCPA goals. The Company seeks to gain more experience in operation, coordination, and dispatch of energy storage facilities to support safe and reliable electric distribution system operation.

2023 to 2024 Variance:
The projected investment is shown in Table 4-37 below. The forecast has increased from 2023 primarily due to projects for Customer Owned DER, shown in Table 4-38.

Table 4-37
DER - Electric System Access Spending Rationale Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	0.8	0.0	0.0	0.0	0.0	-	0.8
2024	-	0.0	0.0	0.0	0.0	1.1	1.1

Table 4-38
Company Owned DER Summary ($ millions)

CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	-	-	-	-	-	-	-
2024	-	0.0	0.0	0.0	0.0	1.1	1.1

The following programs are expected to exceed $1 million in any fiscal year:

- Kenmore Station 22 Energy Storage (C093917) – This project is for a Non-Wires Alternative initiative to reduce the expected electrical stress on the Sub-Transmission lines in the Kenmore area. Battery storage at the Kenmore Station 22 distribution bus breaker will help provide this relief.

4. J. Non-Infrastructure

This spending rationale includes projects that do not fit under other spending rationales but are necessary for the safe and reliable operation of the distribution system. They include capitalized tools such as micro-processor-based relay test equipment and SF6 gas handling carts. In addition, Land Mobile Radio ("LMR") systems not associated with the transmission and distribution system are included in this spending rationale.

Drivers:
Specialized tools are required by Operations personnel to perform equipment maintenance and for capital projects. Similarly, radio communication system upgrades and replacements are necessary for real-time communications while performing switching and for other operational needs.

Customer Benefits:
The proper tools allow Operations personnel to work safely and efficiently. Radio communications promote personnel safety by allowing the control centers to direct Operations personnel during field switching. In addition, timely communications allow a coordinated response to interruptions thereby limiting the duration of customer interruptions.

2023 to 2024 Variance:
The projected investment is shown in Table 4-39 below. The forecast has been updated to reflect latest spending trend.

Table 4-39
Non-Infrastructure Spending Rationale Summary ($ millions)

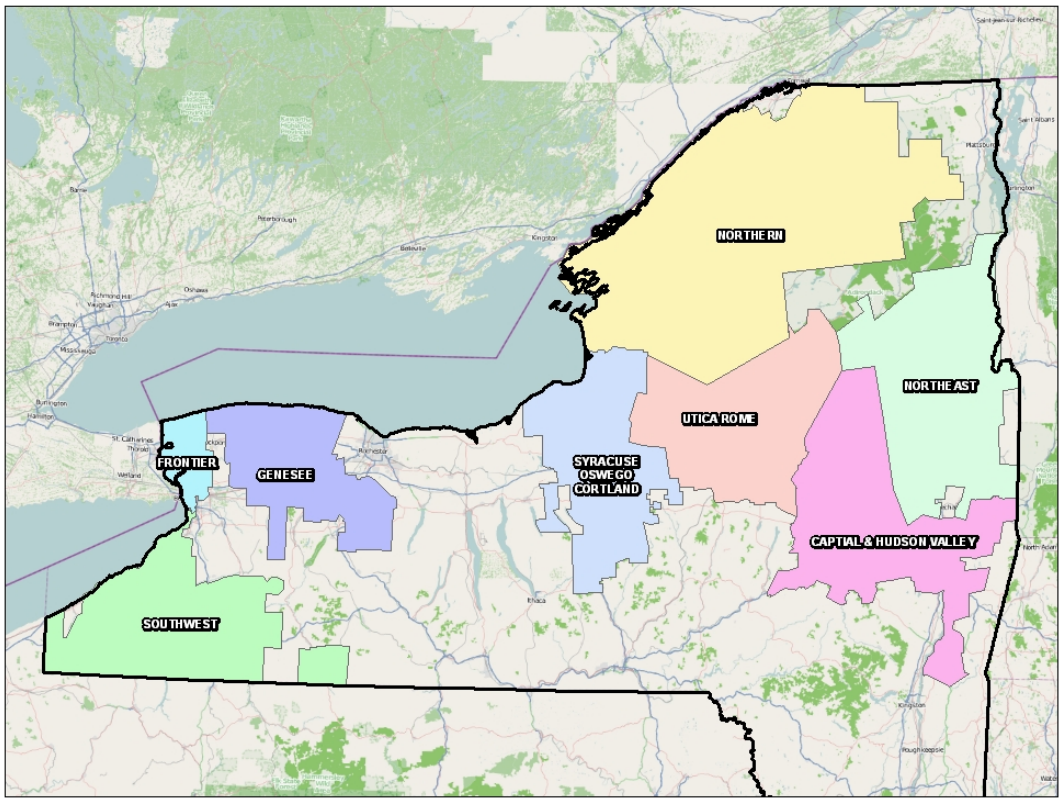
CIP	FY24	FY25	FY26	FY27	FY28	FY29	Total
2023	3.9	4.0	4.1	4.3	4.5	-	20.9
2024	-	4.4	4.5	4.6	4.8	4.9	23.2

There are no specific projects in this category forecasted with planned spending in excess of $1 million in any fiscal year.

Chapter 5: Investment by Transmission Study Area

For regional analysis, the Company's service territory is divided into eight transmission study areas. The transmission study areas are shown in Figure 5-1. Within the eight transmission study areas, the sub-transmission and distribution networks are further subdivided into 43 distribution study areas.

Figure 5-1
Transmission Study Areas



Each of the transmission study areas is described separately below in the following format:

- Area Summary
- Area Description
- Major Project Table

5. A. Northeast Transmission Study Area

Area Summary

Key drivers behind the transmission capacity related projects in this transmission study area include the following:

- Transmission needs will be driven by renewable generation interconnections and some asset condition issues.

Key sub-transmission and distribution drivers include the following:

- In conjunction with the Mohican transmission substation rebuild project, a 13.2kV distribution transformer will be added at Mohican with four new distribution feeders to address significant asset condition issues at the McCrea Street 272 and Henry Street 316 substations; both of which will be retired. The new Mohican distribution bank will also allow the Farnan Road 476 and Hudson Falls 088 mini substations to be retired, providing additional capacity for distributed generation.
- A review of the condition of the Schuylerville – Mechanicville #4, 34.5kV line determined that 90% of the poles on this 15.5-mile sub-transmission line are in need of replacement. The condition of this line is driving the creation of a new 13.2kV distribution feeder out of the Battenkill substation which will allow for the retirement of the Schuylerville – Mechanicville #4 line.
- The deterioration of the Saratoga 142 substation within the city limits of Saratoga Springs, in conjunction with the Saratoga substation's location on a former coal gasification site with identified environmental issues, is driving the addition of a second distribution transformer at the Smith Bridge 464 substation. This will allow for the retirement of the Saratoga substation and the conversion of the remainder of the distribution within the City of Saratoga Springs to 13.2kV standards. This will provide more feeder ties with surrounding 13.2kV substations which could be automated in the future to increase system reliability.
- A new 69kV circuit switcher will be installed within the Cobleskill 214 Substation as the high-side protection for an installed but not connected, 69/13.2kV, 10/12.5MVA distribution transformer. In addition, a low side bank breaker and three 13.2kV feeder breakers will be installed with all associated bus work. Once the substation work is complete, the three 4.8kV distribution feeders served out of Cobleskill will be rebuilt as needed to be converted to 13.2kV eliminating a 4.8kV island.

Area Description

The Northeast transmission study area serves approximately 133,900 customers. The study area extends approximately 90 miles north along the western Vermont border, from Cambridge in the south to Westport in the north and extends approximately 45 miles to the west at its widest point to Indian Lake. The area incorporates the southeastern section of the Adirondack State Park. Much of the area load is concentrated in the southern portion of the study area, along Interstate I-87 and US Route 9, particularly in the Towns of Ballston Spa, Lake George, and Queensbury and the cities of Saratoga Springs and Glens Falls. Some of the areas offer summer recreation and see a spike in load during the summer months, while some of the northern section of the Northeast area is winter peaking.

The Northeast transmission area consists primarily of 115kV rated facilities. The 115kV system runs primarily in a north-south direction on both sides of the Hudson River. There is a single radial 115kV line, east of Lake George, which runs north from the Whitehall substation through Ticonderoga and Crown Point to the Port Henry substation and then extends to the NYSEG system north of Port Henry. The western 115kV radial line extends from the Spier Falls substation to the North Creek substation in the Adirondack State Park. There is an extensive 34.5kV system in the study area supplying the heart of Glens Falls and Saratoga Springs as well as smaller towns along Interstate I-87 and Route 28 and throughout the entire region.

In the Northeast transmission study area, there is one distribution study area, also referred to as Northeast. The Northeast distribution study area has a total of 117 three-phase distribution feeders that supply customers in this area. There are 96 13.2kV feeders, with 25 being supplied from 34.5-13.2kV transformers, and the remaining 71 supplied by 115-13.2kV transformers; 35 34.5kV sub-transmission lines that supply the distribution step down transformers in the area; eight 4.8kV feeders with six supplied by 34.5-4.8kV transformers; and 13 4.16kV feeders all supplied by 34.5-4.16kV transformers.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-1
Northeast Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	Spier-Queensbury #17 ACR	C060211
				Spier-Queensbury #5 115kV ACR	C060210
				Spier-Rotterdam 2 Re-insulate	C081676
				Warrensburg-Schofield Rd 10 Str Repl	C086755
	D/SUB T_Asset Replacement	Distribution	Mountain District	Birch Ave 52 - Big Hollow Rd Refurb	C086986
			Saratoga District	Schuylerville Retirement - Dist.	C084726
		Sub-T	Champlain District	Chestertown-Schroon 3 34.5kV Refurb	C084009
			Mountain District	Warrensburg-Chestertown 6-refurb	C084012
			Saratoga District	Cement Mt - Cambridge 2 ACR	C094072
				Spier Falls - Ballston 3, 11, 12, 10, & 5 ACR	C084068
	D/SUB T_Sub-T Overhead Line	Sub-T	Glens Falls District	Queensbury-Henry Street 14-34.5kv	C046442
			Northeast Region	Schuylerville Retirement - Sub-T	C050323
			Saratoga District	W. Milton Tap-34.5kV new line	CD00898
Damage/Failure	D/SUB T_Damage Failure Other	Distribution	Mountain District	Hague Rd 53 - Submarine Cable.	C050522
DER Electric System Access	D/SUB T_Storage	Distribution	Glens Falls District	Gilmantown Energy Storage	C084937

Multi-Value Distribution (MVD)	MVD_AC_System Capacity	Distribution	Mountain District	Knapp Road Station	C093760
			Northeast Region	Delaware D-Line	C091776
			Saratoga District	Smith Bridge - New TB2 Getaways	C083483
				Smith Bridge 2nd Bank & Metalclad	C081418
				Smith Bridge 56 & 57 -Build Feeders	C083485
		Sub-T	Mountain District	W'burg-Chestertown 6 Reconductor OH	C093770
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Ballston Rebuild: Substation	C093946
				Mohican - Control House	C080755
				Mohican - Rplc 115kV, 34.5kV assets	C053133
				Spier Falls: Asset Rplc/Separation	C081788
Reliability	D/SUB T_Reliability	Distribution	Glens Falls District	Mohican Distribution	C081399
Resiliency	D/SUB T_Microgrid	Distribution	Northeast Region	Ticonderoga Energy Storage Project	C091920
System Capacity - NY	D/SUB T_Load Relief	Distribution	Mountain District	*Hague Rd 52 - Convert Route 22	C050717
			Northeast Region	New Krumkill/Ave A Line	C091773
			Saratoga District	Sodeman Rd 51 Feeder Construction	C076785
				Union St 52 - County Hwy 59	C056632
	To Led System Studies	Transmission	None	Battenkill Rebuild: Substation	C093948

5. B. Capital and Hudson Valley Transmission Study Area

Area Summary

Key drivers behind the transmission capacity related projects in this transmission study area include the following:

- During the summer peak periods, post-contingency thermal overloads exist which require the recommended reconductoring and rebuild of lines as detailed in the project table.
- There are MVT/CLCPA projects planned for the area between Inghams and Rotterdam to support the large amount of renewable generation proposed for the area.
- Interconnection of renewable energy sources to the transmission grid.

There are multiple asset condition-related projects, such as substation rebuilds and line refurbishment.

Key sub-transmission and distribution drivers include the following:

- Liberty Street 094 Station in the city of Troy will upgrade TB1 from a 34.5kV-4.16kV, 5/6.25MVA transformer to a 34.5kV/13.2kV, 10/12.5MVA transformer, with related bus work, 13.2kV breakers, and getaway cables. Along with associated conversion work on the surrounding distribution in downtown Troy, these projects will eliminate a 4kV island

and provide for more switching opportunities between the surrounding stations, thereby improving reliability in the area.

- The rebuild of the Corliss Park 338 Substation and the associated distribution work from 4kV to 13.2kV standards will address many asset condition, capacity, and voltage issues in the North Troy area. It will also lead to the eventual retirement of the Lansingburg 4kV Substation.
- The Chrisler Ave 257 Substation, which was a 34.5-4.16kV substation that was to be rebuilt to a 34.5-13.2kV, 20MVA station, completed its work and was energized in 2023. The construction of four new Chrisler Ave 13.2kV distribution feeders is ongoing and scheduled for completion in 2027. Once completed, it will allow for the retirement of the distribution assets at Emmet Street 256 substation, which have significant asset condition issues. Emmet Street substation will remain a sub-transmission switching station. The ongoing conversion work on the distribution system will eliminate the 4kV island and improve reliability in the area.
- Swaggertown 364 substation in the town of Glenville will upgrade its 115-13.2kV, 22.4MVA transformer to a 115-13.2kV, 40MVA transformer and will install a fourth feeder breaker allowing for a fourth 13.2kV distribution feeder. The additional capacity and fourth feeder at Swaggertown will facilitate the conversion and offloading of the 34.5-4.16kV Scotia substation to neighboring 13.2kV feeders. The retirement of the Scotia 255 substation will follow shortly thereafter. This project addresses asset condition issues and loading concerns at both Swaggertown and Scotia substation and improves reliability by eliminating the 4kV island fed by Scotia substation.
- Ruth Road 381 substation in the town of Colonie will be upgraded from the existing one 115-13.2kV, 33.6MVA transformer and one 6 position metal clad, to a two 115-13.2kV, 40MVA transformer station with two 6 position metal clads. The new accommodation will allow for the construction of three new feeders out of Ruth Road. Along with the station work new overhead distribution construction and conversion work in the surrounding area will facilitate in the retirement of the 34.5-4.16kV Karner 317 substation. The project addresses asset condition and loading issues at both Ruth Road and Karner substation and will eliminate a 4.16kV island.
- The Newtonville Area Study developed a comprehensive plan that involves many stations that will address asset condition concerns and loading concerns, including the elimination of a 4.16kV island. Johnson 352 substation will upgrade both TB1 and TB2 115-13.2kV, 40MVA transformers, with both metalclad swicthgear to be replaced with 6 position metalclads. Maplewood 307 substation will upgrade its existing bank to a 115-13.2kV, 40MVA transformer. The distribution work involved in this study will construct two new 13.2kV feeders out of Johnson and nearby Forts Ferry 459 substation and convert 4.16kV in the area to 13.2kV. This will enable retirement of the Newtonville 305 and Oathout 402 substations.
- Two of the three feeders for the 115-13.2kV Lasher Road 3221 substation are still under construction and are not in their final configuration. The final configuration of these two feeders will be used to address asset condition issues at Shore Road 255 substation, via its retirement, and loading issues in the Ballston Spa area by transferring load from the Ballston 012 substation to the Lasher Road 32212 substation.
- New Krumkill 421 and Patroon 323 substations will each be upgraded from a single transformer to a pair of 115/13.2kV, 40MVA transformers with 8 total feeder positions at each substation in order to accommodate forecasted load growth in Albany. Once complete, this will allow for the retirement of the 4.16kV distribution and transfer load off

of the 34.5kV network, retiring the distribution at Colvin Ave 313, Seminole 339, and Partridge St 128, all 34.5-4.16kV substations.

Area Description

The Capital and Hudson Valley study area is connected to the Utica Rome study area in the west at the Inghams 115kV substation, the New England system in the east, the Central Hudson Gas and Electric ("CHG&E") and Consolidated Edison ("ConEd") systems in the south, and the Northeast study area in the north. The transmission system consists primarily of 115kV and 345kV transmission lines. There is one 230kV line emanating from Rotterdam Substation that connects to New England. There are multiple transformers connecting the LS Power 345kV Gordon Road Substation to National Grid's Rotterdam substation. The Capital and Hudson Valley study area is the east end of the Central-East interface, which is a power interface between central New York and eastern New York. Several transmission lines in the area are also important facilities to the Upstate New York/Southeast New York interface between the eastern and downstate NY systems.

National Grid has three 345-115kV transformers in the region: two at New Scotland and one at Reynolds Road. There are five existing 230-115kV transformers: three at Rotterdam, and two at Eastover Road. In addition, ConEd has one 345-115kV transformer at Pleasant Valley and CHG&E has one 345-115kV transformer at Hurley Ave. station, all of which impact the National Grid system.

Within the Capital and Hudson Valley study area, there are six distribution study areas: Capital-Central, Capital-East, Capital-North, Mohawk, Schenectady, and Schoharie.

The Capital-Central study area serves approximately 110,000 customers. The study area encompasses the greater Albany area, including a mixture of commercial customers heavily concentrated in downtown Albany and industrial and residential customers spread across downtown to the suburban areas. The primary distribution system in Capital-Central is predominantly 13.2kV with pockets of 4.16kV primarily in the City of Albany and 4.8kV south of the City of Albany. Most 4kV distribution substations are supplied from the local 34.5kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the local 115kV transmission system.

The Capital-East study area serves approximately 88,200 customers. The study area is located east of the Hudson River, with the center approximately adjacent to the City of Albany. This area extends approximately from Valley Falls in the north to Tivoli in the south. The larger load concentrations are in the cities of Rensselaer and Troy and in the towns along US Route 9. There is a 345kV source into the area at Reynolds Road substation and a 115kV corridor running in a north-south direction supplying approximately 90% of the distribution load in the area. There is also a 34.5kV sub-transmission system in the central area with the 115kV sources from Greenbush, North Troy, Hudson, and Hoosick substations. In addition, there is scattered generation on the 34.5kV system in the area.

The Capital-North study area serves approximately 102,000 customers. The study area encompasses the suburban area north of the City of Albany, including a mixture of industrial, commercial, and residential customers throughout Colonie, Cohoes, Watervliet, Clifton Park, Halfmoon, Waterford, Niskayuna, and Ballston. The primary distribution system in Capital-North is predominantly 13.2kV with a few pockets of 4.16kV in the Newtonville area and 4.8kV in the

Town of Ballston. All 4kV distribution substations are supplied from the 34.5kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the 115kV transmission system. Maplewood and Patroon substations are the main sources for the 34.5kV sub-transmission system in this area, which is operated in a loop configuration. Along with these facilities, a group of hydro and cogeneration power plants located along the Mohawk River (School St., Crescent, Vischer Ferry, Colonie Landfill, etc.) form the backbone of the local 34.5kV sub-transmission system. In addition to supplying power to all 4kV and a few 13.2kV distribution substations, the 34.5kV sub-transmission system serves several industrial customers such as Mohawk Paper, Honeywell, Norlite, and Cascade Tissue. Major distribution customers in this area include the Albany International Airport, which is supplied by feeders from Forts Ferry, Sand Creek, Wolf Road, and Inman Road substations.

The Mohawk study area serves approximately 67,000 customers. The study area includes the City of Amsterdam and the rural areas west of the city. This area is comprised of mostly residential customers and farms with some commercial and industrial customers located in areas such as the City of Amsterdam, Gloversville, Johnstown, Northville, and Canajoharie. The primary distribution system in Mohawk is predominantly 13.2kV with areas of 4.16kV (Gloversville and Johnstown areas) and 4.8kV (Canajoharie). Most 4kV distribution substations are supplied from the 23kV and 69kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the 115kV transmission system.

The Schenectady study area serves approximately 60,800 customers. The study area is defined by the region that includes the City of Schenectady and the surrounding suburban areas. This area includes a mixture of industrial, commercial and residential customers spread across downtown to suburban areas such as Niskayuna, Glenville, and Rotterdam. The primary distribution system in the Schenectady area is predominantly 13.2kV with a few pockets of 4.16kV (Schenectady, Scotia, and Rotterdam areas). All 4kV distribution substations are supplied from the local 34.5kV sub-transmission system, whereas most 13.2kV distribution substations are supplied from the local 115kV transmission system. In addition, the downtown areas of Schenectady are served by a general network that is supplied by the Front Street Substation. Rotterdam, Woodlawn, and Rosa Rd. are the main sources for the local 34.5kV sub-transmission system, which is operated in loop configuration.

The Schoharie study area serves approximately 21,600 customers. The study area is defined by the region west and south of the City of Schenectady that includes towns and villages along the I-88 and Route 20 corridors such as Delanson, Schoharie, Cobleskill, Schenevus, and Sharon Springs. This area is mostly rural and is comprised mainly of residential customers and farms with few commercial and industrial customers. The primary distribution system in Schoharie is predominantly 13.2kV with areas of 4.8kV (Cobleskill, Worcester, and Schenevus areas). Most distribution substations in this region are supplied from the local 23kV and 69kV sub-transmission system. Marshville and Rotterdam are the main sources for the local 69kV sub-transmission system which is operated in loop configuration. The 69kV sub-transmission system supplies power to both 4kV and 13.2kV distribution substations, and a few industrial and commercial customers, such as Guilford Mills and SUNY Cobleskill. The existing 23kV sub-transmission system in Schoharie, which supplies power to East Worcester, Worcester, and Schenevus substations, is operated in radial configuration from Summit substation.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-2
Capital and Hudson Valley Major Projects

Spending Rationale	Capex Program Name	Budget	Distribution Planning Region	Project Description	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	Amsterdam-Rotterdam3/4 Relocation	C081471
				Feura Bush - N. Catskill 2 ACR	C083073
				Greenbush - N Troy Corridor ACR	C094479
				Leeds - SVC Prot & Cont Repl	C091040
				Menands Cntrl Bldg & Relay Replcmt	C049601
				N.Scotland-Feura Bush/Long Lane ACR	C084554
				NEW SCOTLAND R93&R94 ASSET REPLACE	C062752
				Newtonville Area Study: Maplewood	C091024
				Rotterdam - New Scotland 19 ACR	C084588
				Thompson-N Troy Corridor ACR	C081667
				Trinity Pumping Plant Refurb	C091980
	D/SUB T_Asset Replacement	Distribution	Albany District	Patroon Feeder Getaways	C092740
			Schenectady District	Lasher Road - 53 Feeder OH	C068348
		Sub-T	Albany District	Colvin-Partridge #2 Reconductor	C092870
				Partridge-Avenue A #5 - Reconductor	C092869
				Snyders Lake - Hoag 9 ACR	C094083
			Schenectady District	Rotterdam-Scotia Road 32 34.5	C046455
	D/SUB T_Sta Metal-Clad Switchgear	Distribution	Albany District	Pinebush - Replace Metalclad Gear	C046744
			Hudson District	Blue Stores - Replace IMCS	C081611
			Troy District	Sycaway - Metalclad Replacement	C081630
	D/SUB T_Substation Power Transformer	Distribution	Albany District	Altamont TB2 Replacement	C086700
	D_REP-Substa Transformr Replacement	Distribution	Capital Region	Trinity TB4 and TB6 XFMRs and Bus	C086717
	D_REP-Substation Breaker Replacement	Distribution	Albany District	Trinity 115kV OZB Brkr rpl	C085825

	D/SUB T_Substation Breaker	Distribution	Schenectady District	Emmet St Station - ARP	C094474
Communications/Control Systems	Telecom	Transmission	None	Spier Falls ADSS Fiber to Sodeman	C091012
				Telecom Reynolds-North Troy FOC	C088657
Customer Request/Public Requirement	D/SUB T_Public Requirements	Distribution	Capital Region	Mobile Storage at Guilderland	C094584
Damage/Failure	D/SUB T_Damage Failure Other	Distribution	Albany District	DF- Riverside Sta 288- TB4 Failed	C091468
			Capital Region	NY Mobile 2E - Replacement	C086808
	Damage/Failure	Transmission	None	NYED Trans Verizon Disconnect	C089943
Multi-Value Distribution (MVD)	D/SUB T_Load Relief	Distribution	Schenectady District	Burdeck Station Rebuild	C093727
	D/SUB T_Primary UG Cable Replacement	Distribution	Albany District	Riverside 28855 UG Cable Replaceme.	C036468
	MVD_AC_Hosting Capacity	Distribution	Capital Region	Lasher Road Feeder #52 Conversions	C086787
	MVD_AC_System Capacity	Distribution	Albany District	Avenue A Station Rebuild	C056609
				Newtonville Area Study: D-Line	C091022
				Ruth Road Station Rebuild	C081613
			Capital Region	Karner 4.16 kV Feeder Conversions	C049958
				Sand Creek 54 Distribution	C052306
			Cobleskill District	Cobleskill Area Study D-Line	C091671
				Cobleskill Connect Transformer TB2	C086902
				Schenevus 26127 13.2 kV Rebuild	C093667
			Gloversville District	Manheim Distribution	C074489
			Schenectady District	Ruth Road Rebuild Distribution Work	C052304
				Swagertown Station Upgrades	C091754
				Swaggertown 54 and Scotia Conversion	C091774
			Troy District	CORLISS PARK XFMR 2 & BUS INSTALL	C081991
				Liberty St TB5 Install 34.5/13.8kV	C081420
				Newtonville Area Study: Johnson	C091023
		Sub-T	Gloversville District	Manheim 46kV relocation	C074485
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Gloversville - Marshville #6 Refurb	C081458

				Greenbush Station Rebuild (base project)	C079224
				Greenbush T-Line	C091535
				Hoosick - Replace Bank 1 & relays	C053132
				Interregional Intertie - Line	C094532
				New Manheim - Assoc Line work	C060240
				New Manheim Control House	C074000
				New Manheim Greenfield project	C050917
				North Troy - 34.5kV refurb/rebuild	C079223
				Reynolds Road - Asset Replacement	C077616
				Rotterdam Asset Replacement	C034850
				Woodlawn Transformer Replacement	C051986
	MVT Generator Additions	Transmission	None	Inghams/Rotterdam Circuit Rebuild	C088402
				Marshville 115kV Rebuild	C088329
				Marshville New Substation	C090032
				Marshville TLine New Substation	C090046
				Meco 115kV Rebuild	C088414
				Saltsman Rd New 5 Breaker Ring	C091495
	MVT Reliability	Transmission	None	MVT Rott 69kV Rebuild & New TB	C082180
				MVT Rott 69kV Rebuild & New TB - CH	C092550
				MVT Scho/Sch Int-Rott 18/4 Rebld	C082182
Reliability	D/SUB T_ERR_Eng Reliability Review	Distribution	Schenectady District	Chrisler Ave 25735 Conversion	C057133
	D/SUB T_Reliability	Distribution	Albany District	New Krumkill 42154	C091181
				Patroon Construct New Feeders	C081583
				Unionville 52-Convert Delmar 27941	C089575
			Gloversville District	CLCPA Clinton 54 to Temp Sub Marshville 51	C091832
				CLCPA Marshville Temporary Sub	C091833
				CLCPA St Johnsville 51-Salisbury 53	C091830

				CLCPA St Johnsville 54 - Inghams 51	C091831
				Stoner 53 - 477 to County Hwy 107	C091771
			Schenectady District	Targeted UG - Grooms Rd Tie	C093862
			Troy District	Corliss Park South Feeder Conversio	C081414
	Performance	Transmission	None	CLCPA Marshville Temporary Sub	C093978
				St. Campus-Menands #15 UG Replmt	C088133
Resiliency	D/SUB T_Targeted Feeder Tie Enhancements	Distribution	Cobleskill District	East Worcester 18924 Feeder Tie	C094409
			Schenectady District	Shore Rd 28186 - Elnora 55 Transfer	C067867
			Troy District	*Firehouse Rd Station - New Feeder	C050081
	D_Climate Vulnerability	Distribution	Gloversville District	CCVS(Flood)Gloversville Station 72	C093814
	System Recovery	Transmission	None	Spare NYE Trans Xfrmrs	C090951
System Capacity - NY	Customer Additions	Transmission	None	EV RS - Pattersonville-T-line	C094389
	D/SUB T_Load Relief	Distribution	Albany District	Commerce Station	C091533
				Delmar Feeders Rebuild and Convert	C083926
				Elsmere - Feeder Getaways	C083920
				Elsmere Substation Rebuild	C083916
				New Krumkill - Feeder Getaways	C083927
				New Krumkill Station	C091748
			Capital Region	EV RS - Pattersonville-D-line	C094392
				EV RS - Pattersonville-Sub	C094393
			Capital West Region	Delanson TB1 40 MVA Rebuild	C092947
			Troy District	Liberty St D-Line Overhead Rebuild	C083844
				Seventh Ave North Feeder Conversion	C080476
				Seventh Ave South Feeder Conversion	C080475
				Seventh Ave. 13.2kV Transformer	C080474
	TO Led System Studies	Transmission	None	Ephratah Station Rebuild	C093959

5. C. Northern Transmission Study Area

Area Summary

Key drivers behind the transmission capacity related projects in this study area include:

- Reinforcements to the Northern Area 115kV system are needed due to increased wind and solar generation and declining area load.
- Area load growth resulting in the need for a second transformer and metalclad at the Malone substation.
- All overloads resulting from contingencies can be mitigated by reducing hydro generation, wind generation, or imports from Hydro Quebec.
- A Transmission Resiliency project is being constructed including a new transmission line between Indian River and Lyme Junction (North Watertown).
- Replacing assets at Coffeen and adding a capacitor bank to address asset condition and system voltage issues.
- Interconnecting renewable energy sources to the transmission grid.

Key sub-transmission and distribution drivers include the following:

- Malone substation second transformer, new feeders adding more capacity and switching flexibility to the area.
- Relocating Union Falls substation and the associated sub-transmission lines and distribution feeders due to risk of flooding.
- Distribution construction to improve reliability and eliminate asset condition issues.

Area Description

The Northern transmission study area includes the 115kV transmission facilities in the Northern Region south to Boonville and Lighthouse Hill.

The backbone of the 115kV Northern area system runs from National Grid ALCOA substation to Boonville substation. The important substations along the 115kV transmission corridor are Browns Falls, Colton, Dennison, and Taylorville.

The Jefferson/Lewis County area is bounded by the Lighthouse Hill-Black River 5 and Lighthouse Hill – Middle Road 6 lines to the west and the Taylorville-Boonville 5 & 6 lines to the east. The Ogdensburg-Gouverneur area is served by the 115kV Colton-Battle Hill 7, Colton-McIntyre 8 and the ALCOA-North Ogdensburg 13. The Black River-Taylorville 1 & 2 and the Black River-Coffeen 3 supply the load in the Watertown area. The Thousand Islands region is served by the radial 115kV Thousand Islands-Coffeen 4. The Colton-Malone 3, Malone-Lake Colby 5, and Malone-Willis (NYSEG) 1-910 115kV lines serve the Tri-Lakes region. The Akwesasne Tap 21 served from the Reynolds/GM #1 (NYPA) 115kV line supplies part of the Nicholville-Malone area.

Within the Northern study area, there are four distribution study areas: Nicholville-Malone, St. Lawrence, Tri-Lakes, and Watertown/ Lowville (“WL”). The Nicholville-Malone study area serves approximately 16,100 customers. There are total of 25 feeders - 18 4.8kV and 7 13.2kV feeders - in the study area. The distribution substations are primarily supplied from the 34.5kV system

with the exception of Malone 13.2kV and Akwesasne 4.8kV substations that are served by the 115kV system. The main supplies for the 34.5kV sub-transmission system are Akwesasne, Malone, and Nicholville substations. It is operated as a radial system due to loading issues although the system is constructed as a loop design. There are also two hydroelectric facilities connected to the system (Macomb and Chasm substations).

The St. Lawrence area serves approximately 39,600 customers. There are 23 4.8kV feeders and 30 13.2kV feeders in the study area. The distribution substations are supplied from 23kV and 34.5kV sub-transmission lines with the exception of four substations - Corning, Higley, North Gouverneur and Ogdensburg - that are served from the 115kV system.The main supplies for the 23kV sub-transmission system are Balmat, Little River, McIntyre, and Norfolk substations. Browns Falls substation is the main supply for the 34.5kV sub-transmission system. Mine Road serves as a tie between the 23 and 34.5kV at Balmat and Browns Falls.

The Tri-Lakes area serves approximately 8,800 customers. There are two 2.4kV feeders, 29 4.8kV feeders, and six 13.2kV feeders in the study area. Most of the distribution substations are supplied from the 46kV sub-transmission system apart from Lake Colby and Ray Brook substations that are served by the 115kV system. The supply for 46kV sub-transmission system in the area is Lake Colby substation. There are two municipal electric companies served in the area; one each on the 46kV (Tupper Lake) and the 115kV (Lake Placid).

The WL area serves approximately 70,100 customers. There are nine 23-4.8kV substations supplying 27 4.8kV feeders; and ten 115-13.2kV substations supplying 38 13.2kV feeders. The 23kV sub-transmission system is supplied from the Boonville, Black River, Coffeen, Indian River, North Carthage, Lowville, and Taylorville substations.

Table 5-3
Northern Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	Browns Falls - Asst Sep/Rplc	C081427
				Colony - Asset Replacement	C091871
				Lake Colby - SVC Replacement	C091042
				Mill St Station Rebuild	C093267
	D/SUB T_Asset Replacement	Sub-T	Ogdensburg District	McIntyre-Hammond 24 reloc/refurb	C075852
			Saranac Lake District	Lake Clear - Tupper Lake 38 Refurb	C094142
	D/SUB T_Sta Metal-Clad Switchgear	Distribution	Potsdam District	Little River Station - Sta Rebuild	C085010
	D/SUB T_Sub-T Overhead Line	Sub-T	Lowville District	Carthage-N. Carthage-Deferiet 23kv	C046435
			Saranac Lake District	Union-Ausable Forks 36-46kV ref	C050320

				Union-Lake Clear 35-46kV refurb	C050324
	Failure Trend	Transmission	None	McIntyre-Colton 8 Rein. 275-359	C086662
	D/SUB T_Substation Mobile	Distribution	Watertown District	Mobile 4C - Mobile Sub Replacement	C089181
Communications/Control Systems	Telecom	Transmission	None	Telecom BrownsFalls-Taylorville FOC	C088701
				Telecom Colton-Browns Falls FOC	C088756
				Telecom Dennison-Lawrence FOC	C088757
				Telecom Lawrence - Colton FOC	C088879
DER Electric System Access	D/SUB T_Company Owned DER	Sub-T	Potsdam District	Akwesasne Line 26 Energy Storage	C093829
Multi-Value Distribution (MVD)	MVD_AC_System Capacity	Distribution	Watertown District	Mill St Station Rebuild	C084102
				West Adams 2nd Bank	C084111
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Coffeen - Asset Replace CH	C087772
				Coffeen - Asset Rplc T-line	C089326
				Coffeen: Asset Replacments	C081787
	MVT Generator Additions	Transmission	None	Black River - LHH Rebuild	C089996
				Black River - Taylorville Rebuild	C089997
				Black River Substation Upgrades	C090000
				Coffeen - Black River Rebuild	C090008
				Coffeen - East Watertown Rebuild	C090009
				Coffeen - Lyme Junction Rebuild	C090010
				Coffen Synchronous Condensers	C090023
				Colton - Malone #3 Rebuild	C090024
				Middle Road Sta - Six Breaker Ring	C090051
				Smart Path Connect - T Line	C088956
				Taylorville - Boonville Rebuild	C090050
				Taylorville Sta - BAAH Greenfield	C090053

	MVT Reliability	Transmission	None	Malone Par	C084542
Reliability	D/SUB T_Reliability	Distribution	Lowville District	Soft Maple Rd Conversion 81556	C085999
			Northern Region	Indian River - Install 115kV Brkr	C089578
			Ogdensburg District	McIntyre-Hammond #24 Dist. Taps	C083853
			Watertown District	Mill St_LVAC_2014 Upgrades-N-2	C053903
	D/SUB T_Substaion Flood Mitigation	Sub-T	Saranac Lake District	Union Falls Flood Mitigation_SubT	C068247
Resiliency	D/SUB T_Targeted Feeder Tie Enhancements	Distribution	Clayton District	New Thousand Islands 81457 Feeder	C081805
	Survivability	Transmission	None	Easement/Land -Indian River New 115kV	C092101
				Indian River-Lyme Junction Line	C082190
				Indian River-Lyme Junction Station	C082192
System Capacity - NY	D/SUB T_Load Relief	Distribution	Clayton District	81452 Westminster Park Rd - Rebuild	C052344
			Malone District	Malone 2nd Bank Feeders (D-Line)	C082332
			Saranac Lake District	Union Fall - Flood Mitigation -DSub	C078428
			Watertown District	West Adams New Feeders TB2	C084110
		Sub-T	Malone District	Malone Area Study Sub-T Line	C085514
	TO Led System Studies	Transmission	None	Malone Station Rebuild_Tline	C059673
				Malone Substation Rebuild_T_Sub	C069306

5. D. Syracuse Oswego Cortland Transmission Study Area

Area Summary

The drivers behind the transmission capacity related projects in the Syracuse Oswego Cortland ("SOC") study area are:

- Area load has, over time, reached levels that result in potential post-contingency overloading of multiple 115kV circuits in the Syracuse area.
- The changing location of generation versus load has decreased west-to-east flow and

increased loading on lines west of Syracuse.
- There are a number of Resiliency projects proposed on the 115kV system.
- CLCPA phase 1 projects include replacing some structures on Tilden-Cortland 18 to improve conductor clearances and thereby provide additional capacity; as well as terminal upgrades at Tilden and Fenner to improve capacity.
- CLCPA Phase 2 projects include new greenfield substations at East Ave and Maiden Lane near Oswego as well as rebuilding 115kV transmission lines between South Oswego and Lighthouse Hill, and from Lighthouse Hill to Clay.
- Interconnection of renewable energy sources to the transmission grid.

Key sub-transmission and distribution drivers include the following:

- Load growth in the Syracuse University and North Syracuse areas, including a new major micro-chip manufacturing campus, are major drivers of distribution capacity work.

Area Description

The SOC study area includes the 345kV and 115kV transmission facilities in the Central Region and all the 115kV and above transmission facilities around the Oswego Complex area, including the 345kV Scriba and Volney stations.

The SOC area is bordered by Elbridge substation in the West, Cortland substation in the South, Oneida substation in the East, and Oswego substation in the North. The important substations in the area include Clay, South Oswego, Dewitt, and Geres Lock. This area also includes some of the assets stretching between Mortimer and Elbridge.

Within the SOC study area, there are eight distribution study areas: Cazenovia, Cortland, East Syracuse, Manlius-Fayetteville, North Syracuse, Syracuse, Volney and West Syracuse.

The Cazenovia study area serves approximately 5,300 customers. The study area is a very rural region, with the Village of Cazenovia and the Cazenovia Industrial Park being the only large loads. The distribution system consists of one 34.5-13.2kV substation, three 34.5kV-4.8kV substations and one 34.5-4.16V substation. The only physical constraint is Cazenovia Lake and the residential load, which is spread around Cazenovia Lake.

The Cortland study area serves approximately 26,000 customers. The study area is defined by the region that includes the City of Cortland and the surrounding towns and villages. It is located in central New York between Syracuse and Binghamton. The primary distribution system voltages in Cortland are 13.2kV and 4.8kV. Most of the area is fed from a 34.5kV sub-transmission system supplied out of the Cortland and Labrador substations.

The East Syracuse study area serves approximately 12,100 customers. The study area is an industrial suburb of the City of Syracuse. The distribution system consists of one 115-34.5kV, three 115-13.2kV, one 34.5-4.8kV and one 34.5-4.16kV substations. The transmission supply is adequate. The only physical barriers are Interstate I-690 and Interstate I-481 which go through the area. Customers are served via 12 13.2kV feeders and two 4.8kV.

The Manlius Fayetteville study area serves approximately 24,200 customers. The study area is a residential suburb of Syracuse. The distribution system consists of one 115-34.5kV and four 115-13.2kV substations. Most new load additions to the area are residential developments.

The North Syracuse study area serves approximately 74,300 customers. The study area is the northern suburb of the City of Syracuse. It has experienced the majority of the new housing which has been built in the Syracuse metropolitan area. The distribution system consists of one 115-34.5kV, nine 115-13.2kV, three 34.5-4.8kV and one 34.5-4.16kV stations. The physical barriers in the North Syracuse area are the two interstate highways, I-81 and I-90.

The Syracuse study area serves approximately 71,900 customers. The study area is made up of the City of Syracuse. The primary distribution system voltages in Syracuse are 13.2kV and 4.16kV. There is also a 12kV network fed out of Ash St. substation. Most of the area is fed from a 34.5kV sub transmission system supplied by Ash St, Elbridge, Solvay, Teall Ave., and Tilden substations. There is also some 13.2kV fed directly from the 115kV transmission system.

The Volney study area serves approximately 46,600 customers. The study area includes the cities of Oswego and Fulton. The distribution system consists of four 115-34.5kV, seven 115-13.2kV, five 34.5-13.2kV, eight 34.5-4.8kV and one 34.5-4.16kV substations. A physical barrier in this area is the Oswego River, which is also a canal.

The West Syracuse study area serves approximately 23,100 customers. The study area is a suburb west of the City of Syracuse. The distribution system consists of one 115-34.5kV, two 115-13.2kV, and four 34.5-4.16kV substations.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-4
Syracuse Oswego Cortland Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	Brder City-Elbrdge #10/#5 Crossings	C075723
				Bristol Hill - Asset Replacement	C084072
				Clay - 345kV relay replacement	C089255
				Clay Substation 115kV Spare Bay Tap	C084077
				Clay to Wetzel Tap	C069533
				Curtis St - Teall #13 ACR	C084496
				Dewitt - Rplc 345kV CB R130	C093056
				Lafayette-Clarks Corner 4-46 Str Replacements	C090652
				Mallory 115kV Breakers	C084074
				Mallory Rd. Station CH	C091198
				S Oswego-Clay #4 T-334 Rebuild	C075544
				Scriba - Rplc CB R200	C093255
				Scriba-Volney 20/21 Lam Arm/ACR	C093004

				Solvay: Asset Replacement	C079463
	D/SUB T_Asset Replacement	Distribution	Cortland District	Cortland Area-study Substation work	C090284
		Sub-T	Cortland District	Cortland 20 refurbish 34.5 kV	C081639
			Syracuse District	Mallory-Cleveland 31 34.5kV Refurb	C084194
				Pebble Hill-Tilden 32 34.5kV Refurb	C083971
				Woodard 24 Refurb	C094066
				Woodard-Ash27 Partial UG OH portion	C086593
				Woodard-Ash27 Partial UG UG portion	C086594
	D/SUB T_Sta Metal-Clad Switchgear	Distribution	Cortland District	Tuller Hill 246 Unit Metalclad Repl	C056611
			Syracuse District	Pine Grove Metalclad Replacement	C056614
				Rock Cut Metalclad	C083445
	D/SUB T_Sub-T Overhead Line	Sub-T	Pulaski District	LHH-Mallory 22-34.5kv	C046441
			Syracuse District	Elbridge-Jewitt 31-34.5kV refurb	C050959
				Solvay/Woodard-Ash st 27&27&28-34.	C046439
				Woodard 29-34.5kv	C046473
	D/SUB T_Substation Mobile	Distribution	Syracuse District	Mobile 9C -Mobile Sub Replacement	C089184
	D/SUB T_Substation Breaker	Distribution	Syracuse District	Belmont Station 260 - ARP	C094486
Communications/Control Systems	D/SUB T_Telcom	Distribution	Syracuse District	Syracuse NZE Housing - CIP	C087889
	Telecom	Transmission	None	Telecom Geres Lock-Woodard FOC	C088700
Customer Request/Public Requirement	Customer Interconnections	Transmission	None	[redacted]	C092344
	D/SUB T_Public Requirements	Distribution	Syracuse District	I-81 Viaduct Project DOT Contract 3 Distribution	C091245
				Mobile Storage at Chettenango	C094585
				PIN#3501.60 I-81 Future Placeholder	C091451
Damage/Failure	Damage/Failure	Transmission	None	Lafayette R915 rplc top 5 SF6 leaks	C088905
				Mallory TB-1 Damage Failure	C089594
				NYCD Trans Verizon Disconnect	C089938
				Solvay - Rplc TB#1	C089947
				Upstate NY Trans Verizon Disco FY24	C092760
				Volney Station MEMCO Replacement	C087900
Multi-Value Distribution (MVD)	MVD_AC_System Capacity	Distribution	Cortland District	Cortland Area-study d-line work	C090298

			Syracuse District	Dorwin D-lines	C093699
				Fayette St Line	C081980
				Fayette St Substation	C081981
				Galeville 71 72&73 fdrs conversion	C050749
				Galeville Station Rebuild	C050746
				Rebuild Ash 4160	C082032
				Syr-State St-Cables	C083235
				Temple Distribution Rebuild	C079534
				UG for Temple Rebuild	C079532
			Volney District	E. Fulton Station Retirement D-Line	C093649
				Granby Center Expansion	C093650
				Mexico Dline	C093643
				Third St. Retirement D-Line	C093651
				Whitaker station expansion	C093648
		Sub-T	Syracuse District	Bristol Hill-Phoenix 23-34.5kv	C046474
				Minoa D-Line	C093707
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Geres Lock - CH replacement	C090822
				LightHH 115kV CH	C073996
				LightHH 115kV Yard Repl & cntrl hs.	C031662
				LightHH Trans Lines Reconnect	C073997
				Oswego: 345kV Asset Sep/Repl	C076218
				Teall Ave - Asset Replacement	C086893
				Teall-Carr 6 Rebuild	C091985
				Tilden: Asset Replacement	C081785
	MVT Generator Additions	Transmission	None	Clay Substation CLCPA Upgrades	C090006
				East Ave Station - Greenfield	C090027
				Lighthouse Hill - Clay Rebuild	C090028
				Lighthouse Hill - S. Oswego Rebuild	C090029
				Maiden Lane station - Greenfield	C090031
				South Oswego Station Upgrades	C090052
				Tilden-Cortland LN18 Clearance	C088415
Reliability	D/SUB T_Reliability	Distribution	Syracuse District	Bartell 55 Delta Conversion	C094187
				South Oswego-Whitaker Resiliency	C090776

				Wetzel Rd 55 Delta Conversion	C094192
	Performance	Transmission	None	Cicero Substation T-Line Taps	C093003
Resiliency	D/SUB T_Targeted Feeder Tie Enhancements	Distribution	Mohawk Valley Region	fdr tie Gilbert Mills - New Haven	C094367
			Syracuse District	Milton Ave DLine	C046643
	Survivability	Transmission	None	Dewitt-Tilden Resiliency	C084535
				Teall - Oneida Resiliency	C084541
	System Recovery	Transmission	None	Mobile Xfrmr 115-34.5-23kV 25MVA	C090270
				Mobile Xfrmr 115-34.5-23kV 50MVA	C090264
				Spare NYC 115/46kV,20/33MVA Xfrmr	C090949
System Capacity - NY	Customer Additions	Transmission	None	EV RS - Chittenango-T-line	C094386
				EV RS - Dewitt-T-line	C094383
	D/SUB T_Dist Transformer Repl	Distribution	Cortland District	Lord'sHill 67 fdr 13.2kV conversion	C093933
	D/SUB T_Load Relief	Distribution	Cortland District	Cortland Area-study tie work	C091362
				Cortland LVAC_Disassemble	C087469
				Cortland Sta- LN1 3 18 THERM UPG	C088450
			Pulaski District	Constantia D-Line Sub	C093653
				East Pulaski Transformer Upgrade	C046634
			Syracuse District	Cicero D-Line	C091779
				Cicero Substation	C091713
				Hancock 2 DLine upgrade	C093668
				Sand Road 2 DLine upgrade	C093669
		Sub-T	Syracuse District	MITS Sub	C093716
	TO Led System Studies	Transmission	None	Dewitt Station 115kV Rebuild	C081783
				Dewitt Station 115kV Rebuild LAB	C081784
				Recond Cortland Clarks Corners	C053141

5. E. Utica and Rome Transmission Study Area

Area Summary

The drivers behind the transmission capacity related projects in this study area include the need to address thermal and voltage issues in area substations and to improve resiliency of the system.

- Oneida substation new capacitor bank for improved system voltage control.
- Rebuilding of Oneida and Boonville substations to address asset condition issues.
- Yahnundasis-Porter #3 Resiliency project.
- The National Grid portion of the Smath Path Connect project with new 345kV transmission from Adirondack to Marcy and Edic and a new transmission substation at Austin Road.
- Interconnection of renewable energy sources to the transmission grid.

Key sub-transmission and distribution drivers include the following:

- Refurbishment of several 46kV sub-transmission circuits to address asset condition concerns.
- Rebuilding of Terminal Substation to address asset condition, reliability and environmental concerns.

Area Description

The Utica Rome transmission study area includes the 115kV and above transmission system with the northern boundary at Boonville substation, west at Oneida, and east ending before Inghams substation. Within the Utica Rome study area, there are four distribution study areas: Oneida, Rome, Utica and Old Forge.

The Oneida study area serves approximately 18,500 customers. The study area includes the City of Oneida and the Village of Canastota. In the City of Oneida, the Oneida Hospital has dual distribution supplies. Nearby, H.P. Hood Dairy Products Inc.'s facility represents 4MVA of the load and has dual distribution supplies. The Village of Canastota, which is in western section of the Oneida area, has several large commercial and industrial customers including Canastota Industrial Park, Owl Wire and Cable, Inc. and Die Molding Inc. A geographic constraint is the distance to other substations and the lack of feeder ties. There have been improvements made to feeder ties between the Oneida and Peterboro substations. Developing these ties was challenging due to the New York State Thruway's stringent road crossing regulations.

The Rome area serves approximately 26,400 customers. There are 16 13.2kV and 10 4.8kV feeders in the study area. All distribution substations are supplied from the 115kV system. As a result, there are no sub-transmission lines in the area.

The Utica study area serves approximately 81,500 customers. The study area includes the City of Utica. The distribution system consists of four 115-46kV, 10 115-13.2kV, six 46-13.2kV and eight 46-5kV substations. Rock City substation will be converted to 46-13.2kV to address loading concerns at So. Washington and Salisbury substations.

The Old Forge study area serves approximately 7,900 customers in Old Forge. There are five 46-4.8kV substations supplying nine 4.8kV feeders and one 13.2kV substation supplied out of Alder Creek substation. The 46kV sub-transmission system is supplied out of the Boonville substation. The 46kV sub-transmissions system also serves approximately 1,800 NYSEG customers in Long Lake.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-5
Utica Rome Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	Utica District	Deerfield: Asset Replacements	C081797
				Yahnundasis: Asset Replacement	C081794
	D/SUB T_Asset Replacement	Distribution	Utica District	Terminal Station Relocation_DLine	C059671
		Sub-T	Utica District	Raquette Lake Padmount Xfmer	C082716
	D/SUB T_Primary UG Cable Replacement	Distribution	Mohawk Valley Region	MV-Camp KillKare/Lake Kora-Cable	C088822
	D/SUB T_Sub-T Overhead Line	Sub-T	Mohawk Valley Region	Trenton-Whitesboro 25 46kV	C058579
			Utica District	Deerfield-whitesboro 26-46kv	C046459
				Yahnundasis-Clinton 24 - 46kv	C046449
Communications/Control Systems	Telecom	Transmission	None	Telecom Boonville-Porter FOC	C088655
Multi-Value Distribution (MVD)	MVD_AC_System Capacity	Distribution	Utica District	Alder Creek Substation Rebuild	C093792
				Central Utica Boutique Sub - D-Line	C093808
				Chadwicks Expansion - D-line	C093804
				Chadwicks Expansion - Sub	C093803
				Debalso Expansion - D-Line	C093802
				MV-Clinton TB1 Replacement HC	C086880
				Stittville Station D-line	C093785
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Boonville - Rebuild Assc Tline work	C082488
				Boonville - Rebuild CH	C082487
				Boonville Rebuild	C049903
				Oneida - Sub Rebuild T-line	C084674
				Oneida - Substation Rebuild CH	C087290
				Oneida Substation Rebuild	C034443
				SCHUYLER Sub	C093968
				Terminal Station Relocation	C076242
				Terminal Station Relocation_TLine	C080493
	MVT Generator Additions	Transmission	None	Boonville - Porter Rebuild	C090003
				Boonville Substation CLCPA Upgrades	C090005
Reliability	D/SUB T_Reliability	Distribution	Utica District	Yahnundasis-Oneida Tie Part 1	C092395
		Sub-T	Mohawk Valley Region	Boonville - Raquette Lake Fiber	C090818
Resiliency	D/SUB T_Microgrid	Distribution	Herkimer District	Energy Storage Order Upgrades	C085964
		Distribution	Herkimer District	Rock City Station - 13.2kV Rebuild	C046671

	D/SUB T_Targeted Feeder Tie Enhancements			Rock City Sub - Distribution Line	C082291
			Rome District	Lehigh 53/Rome 54 Tie Recon. P1	C094422
	D_Climate Vulnerability	Distribution	Utica District	CCVS(Flood)Peterboro 514-Flood Wall	C093813
System Capacity - NY	D/SUB T_Load Relief	Distribution	Herkimer District	Salisbury Station - D-line	C093800
				Salisbury Station - Sub Rebuild	C093794
			Rome District	Cleveland D-Line	C093655
				Rome 55 Delta Conversion Phase 1	C094210

5. F. Genesee Transmission Study Area

Area Summary

The drivers behind capacity driven projects in Genesee area are:

- Supporting the State's Clean Energy Goals with CLCPA Phase I projects at Golah and on Lines between Batavia, Golah and Mortimer.
- Interconnection of Renewable Energy resources to the transmission grid.
- There are also a number of transmission projects in the Genesee study area that have Asset Condition as its main driver.

Key sub-transmission and distribution drivers include the following:

- Capacity load relief concerns in the Geneseo / Livonia areas will be addressed with new distribution feeders supplied from Sonora Way substation.

Area Description

The Genesee transmission study area includes National Grid assets within NYISO Zone B. The area includes assets as far west as Lockport and as far east as Mortimer. The system consists of several 115kV circuits between Lockport and Mortimer stations. Three circuits go directly from Lockport to Mortimer, three circuits go from Lockport to Batavia and several circuits in a series connect Batavia and Golah. Today, one 115kV line and one 69kV line connect between Mortimer and Golah.

Two 345kV circuits owned by the New York Power Authority ("NYPA") travel through this area from Niagara to Rochester.

At Rochester Station 80, Rochester Gas and Electric ("RG&E") has four 345-115kV transformers with 115kV connections to Rochester Station 82. Rochester Station 82 is the RG&E 115kV station adjacent to and tied to National Grid's Mortimer Station.

This area also includes some of the assets stretching between Mortimer in the Western Region and Elbridge in the Central Region also known as the Finger Lakes area.

Within the Genesee study area, there are three distribution study areas: Genesee North, Genesee South and Livingston.

The Genesee North study area serves approximately 42,700 customers. There is a total of 54 distribution feeders that supply customers in this area. There are 22 13.2kV feeders, with four being supplied from 34.5-13.2kV transformers, and the rest being fed from 115-13.2kV transformers. The 32 4.8kV feeders are all fed from 34.5-4.8kV transformers. There are 10 34.5kV sub-transmission lines that supply the distribution step down transformers in the area.

The Genesee South study area serves approximately 33,400 customers. The study area is defined by the region that includes the City of Batavia and the surrounding towns and villages. It is located east of Buffalo and southwest of the City of Rochester. The primary distribution system voltages in Genesee South are 13.2kV and 4.8kV. Most of the 13.2kV system is supplied by the area 115kV transmission system. The rest of the 13.2kV system, as well as the 4.8kV system, are fed from a 34.5kV sub-transmission system supplied out of the North Akron, Batavia, North Leroy, and Oakfield substations. There are several customers supplied directly from the sub-transmission system.

The Livingston study area serves approximately 29,300 customers. The study area is largely made up of Livingston County, which is south of Rochester and east of Batavia. The primary distribution system voltages in Livingston are 13.2kV and 4.8kV. Half of the load is supplied from the 115-13.2kV East Golah, Mumford and Sonora Way substations. The remainder is supplied from 69kV at York Center and the 34.5kV sub-transmission system supplied out of the Golah and North Lakeville substations. Two customers are supplied directly from the 115kV system.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-6
Genesee Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	Brockport Taps ACR	C055531
				Golah-NLakeville#116 Priority 2 Str	C086697
				Lockport-Mortimer 113/114 ACR	C081664
				Pannell-Geneva 4-4A Road Crossings	C030889
	D/SUB T_Asset Replacement	Sub-T	Albion District	Oakfield-Caledonia 201 34.5 Refurb	C083975
				Telegraph-Medina 302 &303 34.5kV	C081634
			Avon District	Golah-N. Lakeville 216-217 refurb	C084016
				North Lakeville-Ridge 218 refurb	C084014
			Batavia District	Attica-Wethersfield 209 34.5kV ref	C081705
				N.Akron-Attica 225 34.5kV Refurb	C084020
	D/SUB T_Sub-T Overhead Line	Sub-T	Albion District	Barker-Lyndonville 301-34.5kV	C052511
Communications/Control Systems	Telecom	Transmission	None	Batavia - Telecom Ring Protection	C085421
				Telecom FOC Alabama-Telegraph-SS	C094074
				Telecom FOC SE Batavia-BSC-N.Leroy	C094076

				Telecom FOC Sweden-Brock-Mortimer	C094075
				Telecom Gardenville-Arcade FOC	C088699
Customer Request/Public Requirement	Customer Interconnections	Transmission	None	Farmington Sta 168 Interconnection	C087525
				Station 56 Interconnect	C085736
	D/SUB T_New Business	Distribution	Genesee Region	Sonora Livonia 3763 Conversion CSD	C093798
DER Electric System Access	D/SUB T_Company Owned DER	Sub-T	Avon District	North Lakeville L218 Energy Storage	C093807
Multi-Value Distribution (MVD)	MVD_AC_System Capacity	Distribution	Albion District	Waterport Asset Condition	C091751
			Avon District	Sonora Way Station - New SWG	C060141
			Genesee Region	Sonora Way - New Feeders	C046552
		Sub-T	Albion District	Waterport tap 301-34.5kV	C052515
			Genesee Region	Phillips-Barker 301-34.5kv	C046465
				Phillips-Telegraph 304-34.5kv	C046466
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Access Rd- Lockport-Batavia 112	C089590
				Lockport-Batavia 107 Rebuild	C086920
				Lockport-Batavia 108 Rebuild	C086921
				Lockport-Batavia 112 T1510 ACR	C003422
				Mortimer-Golah #110 ACR Rebuild	C060220
				Mortimer-Golah 109-69kV Rebuild	C081474
				SE Batavia-Golah 119 ACR	C060217
	MVT Generator Additions	Transmission	None	Mortimer 109 bay 115kV Upgrade	C088632
				SE Batavia - Golah LN119 Rebuild	C088631
	MVT Reliability	Transmission	None	Golah Sub rebuild	C051831
				West Sweden Station	C094417
				West Sweden Station TLine	C094416
Reliability	D/Sub T_Flicker	Distribution	Avon District	Mumford Sta- 115kV Cap Bank	C092217
	D/SUB T_Reliability	Distribution	Avon District	Mumford #50 -Install Transformer #2	C046590
			Batavia District	*Byron F1863 - Rebuild /Reconductor	C049762
	Performance	Transmission	None	RC-MOD Huntley - Lockport 36 & 37	C085239
Resiliency	D/SUB T_Targeted Feeder Tie Enhancements	Distribution	Genesee Region	*Middleport F7765 Tie w/Shelby 7656	C049711
				Feeder 04_0456 Tie with Feeder 5053	C094406
				Feeder 05_5051 Tie with Feeder 5053	C094388
				Feeder 06_9561 Tie with Feeder 06_7863	C094382
System Capacity - NY	Customer Additions	Transmission	None	EV RS - Pembroke (Flying J)-T-line	C094378

	D/SUB T_Load Relief	Distribution	Albion District	Lyndonville Tr Replace	C091756
				New Royalton 13.2kV	C091747
			Genesee Region	East Batavia 55 Delta Conversion	C093854
				EV RS - Pembroke (Flying J)-D-line	C094387
				EV RS - Pembroke (Flying J)-Sub	C094380
	TO Led System Studies	Transmission	None	Access Roads-Mortimer-Pannell 24 25	C093207
				E. Golah 2nd 115kV Tap	C051829
				Easements-Line Rebuild MP 24	C093270
				Mortimer - Pannell 24/25	C047816

5. G. Frontier Transmission Study Area

Area Summary

The principal drivers for transmission projects in this area are:

- The NYISO selected project, in accordance with the Public Policy Transmission Planning Process ("PPTPP"), does not address overloads on the National Grid local transmission system. This results in the need for multiple area projects to relieve thermal constraints.
- High post-contingency 115kV line loadings on lines extending south and east from Niagara, Packard, and Gardenville.
- Recommended major projects that address capacity issues include reconfiguration of the #180, #181 and #182 lines, reconductoring of the #130, #133, #191 and #192 lines, adding a 115kV capacitor bank and bus tie breaker at Huntley, and some reconfiguration and upgrading of limiting elements at Lockport and Mountain stations.
- Connecting renewable energy sources to the transmission grid.
- Asset condition issues at Lockport.
- Supporting the Katherine Street Terminal projects.

Key sub-transmission and distribution drivers include the following:

- To address new commercial load growth in the Larkinville section of Buffalo, a new 23-13.2kV substation (Station 3012 will be used).
- Load growth at the Buffalo Niagara Medical Campus as well as across downtown will be served by Elm Street substation.
- Area loading requiring the upgrade of multiple Buffalo area substations, including Buffalo Stations 61, and 140.
- Indoor substations are an asset condition issue, and there are several replacement projects in progress in Buffalo. Similarly, the condition of Harper 115-12kV station and several indoor substations in the City of Niagara Falls are driving a new 115-13.2kV substation Royal Ave 2715 which has been put in service. Once rebuilds of other stations 80, 83 & 85 are completed and transferred to Royal for supply then Harper Station will be retired.

Area Description

The Frontier transmission study area includes assets within NYISO Zone A. The area includes assets as far east as Lockport, the cities of Niagara Falls and Buffalo areas and the system stretching south to Gardenville. The system consists primarily of 115kV and 230kV double circuit transmission lines. The important substations are Packard (230 and 115kV), Huntley (230 and 115kV), and Lockport (115kV). There is a joint National Grid and NYSEG substation at Gardenville (230 and 115kV). National Grid has three 230/115kV transformers at Gardenville and two at Packard. NYSEG and NYPA also have their own substations in the area.

Within the Frontier study area there are ten distribution study areas: Amherst, Cheektowaga, Elm, Grand Island, Kensington, Niagara, Niagara Falls, Sawyer, Seneca and Tonawanda.

The Amherst study area serves approximately 65,100 customers. The study area is located east of the cities of Tonawanda and Niagara Falls, and north of the City of Buffalo and encompasses the towns of Amherst, Pendleton, Wheatfield, Wilson and Lewiston. The Erie Canal divides the study area and may present challenges in creating new feeder ties and recommended supply expansion. The primary distribution system in Amherst is 13.2kV and 4.16kV, with a few small pockets of 4.8kV. The area substations are supplied by the 115kV transmission system with the exception of Buffalo Station 58 and Buffalo Station 124, which are supplied by 34.5kV sub-transmission lines originating from Youngman Terminal Station and Buffalo Station 67, which is supplied by the 34.5kV sub-transmission lines originating from Walden substation.

The Cheektowaga study area serves approximately 7,900 customers. The area is located east of the City of Buffalo. There are several stations in this area that are supplied by 115kV transmission lines. Walden is the largest; it has two transformers that serve the 34.5kV sub-transmission system. Dale Rd. substation is 115-13.2kV while Buffalo substations 61 and 154 are 115-4.16kV. Buffalo Substation 66 is a 34.5-4.8kV substation. The remaining substations in the area are 34.5-4.16kV. Buffalo Substation 146 has a 34.5-4.8kV and a 34.5-13.2kV transformer.

The Elm study area serves approximately 3,300 customers and is part of the City of Buffalo. It contains the downtown area as well as surrounding urban areas with a mix of residential, commercial and industrial loads. Elm Street substation is a 230-23kV station that supplies the Buffalo network as well as the sub-transmission supply to several distribution stations. The Elm Street substation supplies approximately 120MW of load. Most of the load is served by a low voltage AC general network which is supplied by multiple paralleled transformers with multiple 23kV supply cables thus providing very high reliability.

The Grand Island study area serves approximately 8,700 customers. The study area is made up of Grand Island, which is between the cities of Buffalo and Niagara Falls. It is primarily suburban and rural residential with areas of commercial development and industrial parks. There are two National Grid substations supplied from 115kV lines with distribution feeders at 13.2kV.

The Kensington study area serves approximately 35,600 customers. There are 80 4.16kV feeders that are all fed from 38 23-4.16kV transformers and 19 23kV sub-transmission lines. The Kensington substation has four 115-23kV transformers that provide the supply to the 23kV sub-transmission system. This substation is in the City of Buffalo and the study area contains significant amounts of underground distribution mainlines and overhead laterals. The Kenmore Terminal station supplies several smaller commercial customers and the South Campus of the SUNY at Buffalo.

The Niagara study area serves approximately 12,800 customers. The study area encompasses the towns of Lewiston, Porter, and Wilson. The study area is bordered to the west by the Niagara River, to the North by Lake Ontario, and to the south by Power Reservoir. The area's distribution is served primarily at 4.8kV and supplied by a 34.5kV sub-transmission network. The 34.5kV sub-transmission network operates in a loop system that is supplied by both Mountain and Sanborn 115-34.5kV substations. Swann Road supplies a significant portion of this area and is 115-13.2kV.

The Niagara Falls study area serves approximately 38,700 customers. The study area is bordered to the north, south, and west by the Niagara River. The Power Reservoir also borders the area to the north, east of the Niagara River. Interstate I-190 runs from the north to the south along the eastern section of the study area. The CSX Railroad runs from the east to the west along the northern section of the area. The Niagara Falls International Airport lies east of the city. These boundaries limit feeder ties and distribution supply expansion in the area. The area is supplied primarily by the 115kV transmission system; however, a 12kV sub-transmission system is supplied by Harper and Gibson substations. Distribution load is served by 13.2kV, 4.8kV, and 4.16kV circuits.

The Sawyer study area serves approximately 63,700 customers. The study area contains portions of the City of Buffalo and the Town of Tonawanda. There are 154 4.16kV feeders supplying the area which are served by 23kV supply cables and multiple, paralleled transformers.

The Seneca study area serves approximately 44,100 customers. The study area is the southeast section of the City of Buffalo. It is served primarily from the Seneca Terminal Station which has four 115-23kV transformers and serves 25 supply lines at 23kV. Most of the distribution substations are served by four supply cables and have four 23-4.16kV transformers. As throughout the City of Buffalo, almost all distribution load is served at 4.16kV.

The Tonawanda study area serves approximately 27,400 customers. The study area encompasses the City of North Tonawanda as well as a portion of the City and Town of Tonawanda. Bordering the western section of the area is the Niagara River. Ellicott Creek flows parallel to Tonawanda Creek in the northern part of the town of Tonawanda, with a confluence just east of the Niagara River. These creeks flow through the central part of the area from east to west. The eastern section of the area is bordered by the Town of Amherst and forming the study area's southern border is the Village of Kenmore and the City of Buffalo. The area is served primarily by the 115kV transmission system and the 23kV sub-transmission system. Distribution voltage is served primarily by 4.16kV feeders.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-7
Frontier Major Projects

Spending Rationale	Capex Program Name	Budget	Distribution Planning Region	Project Description	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	Gard-5 Mile Culvert 24 26 31.2 41.2	C087617
				Gardenville 230kV - Asset Rplc	C089270
				Huntley-Lockport 36/37 Ayer Rd ACR	C081670
				Knapp Road Storage Building	C083804
				Packard - Rplc two 115kV OCBs	C079222
				Station 078: Asset Replacement	C081792
				T-XFR Spare 115kV-23kV 50MVA	C081732
				Youngman Terminal - Asset Rplc	C079465
	D/SUB T_Asset Replacement	Distribution	Buffalo District	Bflo Sta 139 - Replace Transformers	C036639
			Frontier Region	Station 61 Distribution Relocation	C084919
		Sub-T	Niagara Falls District	Ransomville-Phillips 402 refurb	C084189
	D/SUB T_Conductor Clearance	Distribution	Buffalo District	Station 79 D-Line Relocation	C084921
	D/SUB T_Dist. Overhead Line (Program)	Distribution	Frontier Region	Gard-Dun 141-142 D Line Relocation	C079005
	D/SUB T_Sta Metal-Clad Switchgear	Distribution	Buffalo District	Station 162 Metalclad Replacement	C052706
			Frontier Region	Station 61 - Metalclad Replacement	C051707
	D/SUB T_Sub T UG Cable Replacement	Sub-T	Frontier Region	10E Cable Replacement	C081761
	D/SUB T_Substation Indoor	Distribution	Niagara Falls District	Beech St 81 - Indoor Substation Ref	C046577
	D/SUB T_Substation Power Transformer	Distribution	Niagara Falls District	Lewiston Heights 086 Rpl TB1	C083225
	D/SUB T_Sub-T Overhead Line	Sub-T	Buffalo District	Shaleton-Ridge 610 Station 207 Tap	C046779
				Tonawanda 601-604 23kV - T22&T23	C067266
				Willowdale Tap 26H 33H 34H ACR	C048911
			Frontier Region	Kenmore-Winspear 630/631-ref	C050318
			Niagara Falls District	Tonawanda Lines 601-604-23kv	C046451
				Tonawanda Lines 622-624-23kv	C046452
	D/SUB T_Substation Breaker	Distribution	Frontier Region	Station 54 - ARP	C094290
Communications/Control Systems	Telecom	Transmission	None	Telecom FOC Gardenville-WRCC	C090924

				Telecom FOC Lockport-Mountain	C090931
				Telecom FOC Packard-NewRdSC-Niagara	C090945
				Telecom FOC Packard-Sawyer	C090921
				Telecom FOC Seneca-Gardenville	C090919
				Telecom FOC WRCC-Lockport	C090935
Customer Request/Public Requirement	D/SUB T_Public Requirements	Distribution	Buffalo District	LASELLE_PARK_RELOCATION	C086922
	Public Requirements (additional need)	Transmission	None	Huntley-Gardenville 79/80 FAA Light	C091994
Damage/Failure	D/SUB T_Damage Failure Other	Distribution	Buffalo District	DF-Station 205- TB3 Failure	C091523
			Frontier Region	DF-Station 54- TB2 Replacement	C091518
	Damage/Failure	Transmission	None	Gard-5 Mile 151&152 Culverts 40&42	C087268
				Huntley to Kensington Fiber D/F	C087893
				NYWD Trans Verizon Disconnect	C089903
DER Electric System Access	D/SUB T_Company Owned DER	Distribution	Buffalo District	Kenmore Station 22 Energy Storage	C093917
Multi-Value Distribution (MVD)	MVD_AC_System Capacity	Distribution	Buffalo District	Buffalo Station 122 Rebuild - Line.	CD00779
				Buffalo Station 25 Rebuild - Sta	C036456
				Buffalo Station 30 - Rebuild - Fdrs	C015754
				Buffalo Station 30 Rebuild - Sta	C046519
				Buffalo Station 31 Rebuild - Line	C046943
				Buffalo Station 31 Rebuild - Sub	C046952
				Buffalo Station 32 Rebuild - Sta	C036459
				Buffalo Station 34 Rebuild - Sub	C046953
				Buffalo Station 35 Rebuild - Sub	C046954
				Buffalo Station 38 Rebuild - Line	C046936
				Buffalo Station 38 Rebuild - Sub	C046955
				Buffalo Station 41 Rebuild - Sub	C046956
				Buffalo Station 45 Rebuild - Line	C090726
				Buffalo Station 45 Rebuild -Sub	C090725
				Buffalo Station 51 Rebuild - Line	C046927
				Buffalo Station 51 Rebuild - Sub	C046958
				Buffalo Station 68 Rebuild - Sub	C046946
				Eighth St 80 - Sub Refurb D-Line.	C046586
				Ohio St - Buffalo River Tunnel/Bore	C050400
				Station 140- D-Line Work	C093018

				Station 140 Station Rebuild	C056616
				Station 79 Rebuild	C082713
			Niagara Falls District	Eighth St 80 - Indoor Substation Re	C046585
				Eleventh St 82 - Indoor Substation	C046582
				Grand Island Station Build	C081485
				Newfane 170 Asset Condition	C091765
				Welch 83 - Sub Refurb D-Line	C046584
				Welch 83 Indoor Substation Refurbis	C046583
		Sub-T	Frontier Region	Buffalo 23kV Reconductor - Huntley	C079450
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Elm St #2 TRF Asset Replacement	C069426
				Huntley-Gardenville 38/39 Rebuild	C075543
				Lockport - Rebuild T-line work	C085990
				Lockport Sub Rebuild CH	C073991
				LockportSubstationRebuildCo3 6TxT	C035464
				Seneca #5 TRF asset Replace	C069427
Reliability	D/SUB T_Reliability	Distribution	Buffalo District	Convert F3462 & 3465 to Underground	C093555
				Convert Louisiana St from OH to UG	C093590
			Niagara Falls District	Long Rd 209 - New F20955	CD00964
				Long Road 209 - Install TB2	CD00977
		Sub-T	Frontier Region	Ludwig-Gardenville 704 34.5kV reloc	C085043
	Performance	Transmission	None	149/150 Reinsulating	C090704
				Packard-Huntley 77 78 Reinsulation	C093019
				RC-MOD Packard-Gardenville 181&182	C085238
				Reinsulate Adams Packard 187 & 188	C090604
Resiliency	D/SUB T_Targeted Feeder Tie Enhancements	Distribution	Niagara Falls District	*Rbld/Conv to Create tie F7652-7651	C049802
	Survivability	Transmission	None	Huntley - Lockport (Getzville)	C084538
	System Recovery	Transmission	None	Spare NYW Trans Xfrmrs	C090950
System Capacity - NY	D/SUB T_Load Relief	Distribution	Buffalo District	Buffalo Station 98 Sub	C091749
				Buffalo Station 99 Sub	C091764
				Station 3012 Substation	C074909
				Upgrade and Convert STA 74 SUB	C093600
			Frontier Region	Station 3012 D-Line Part 2	C085610
		Sub-T	Buffalo District	Katherine St TERM STA 23KV SubT	C089020
			None	130/133 T-Line Reconductor	C079500

	TO Led System Studies	Transmission		Elm St Relief_Add 4th Xfer	C049594
				Frontier 181 ACR/Recond	C060215
				Katherine St Term 115/23kV Sub	C089019
				Katherine St Term L145/146 T-Line	C089018
				Katherine St Term LAND	C089057
				Packard-Gardenville Station Upgrades	C079506
				Pack-Gardenville T-Line Reconfig	C081799

5. H. Southwest Transmission Study Area

Area Summary

The primary drivers of the transmission capacity related projects in the Southwest study area are:

- The interconnection of renewable energy sources to the transmission grid.
- Due to lower load levels, generation retirements, and higher imports from Ontario in Western NY, more power flow is going in a north-to-south direction causing 115kV circuit overloads. Thus, the Gardenville #141/142 115kV circuits will need to be rebuilt.
- Resiliency project on Dunkirk-Falconer #160
- Upgrades and new technology to support the State's clean energy goals

Key sub-transmission and distribution drivers include the following:

- The 34.5kV sub-transmission system, which consists of several very long loops that traverse rugged territory.
- Load growth and reliability concerns in the South Chautauqua portion of the area are driving station projects.
- Load growth and asset condition issues at stations in the Eden/Evans area that are being addressed by a new substation near the Eden switch structure and expansion/upgrade of Delameter Road Substation.

Area Description

The Southwest transmission study area spans as far north as the Gardenville station, east into Wellsville and south into Pennsylvania. The transmission system consists primarily of 115kV and 230kV double circuit transmission lines. The major stations are Gardenville (230-115kV), a joint National Grid and NYSEG station, Dunkirk (230-115kV), Falconer (115kV), Homer Hill (115kV) and the newly constructed Five Mile Road station (345-115kV). National Grid has one 345-115kV transformer located at Five Mile Road and five 230-115kV transformers at Gardenville (three) and Dunkirk (two). NYSEG also has two 230-115kV transformers at Gardenville.

Within the Southwest study area, there are six distribution study areas: Cattaraugus-North, Chautauqua North, Chautauqua South, Erie South, Olean and Wellsville.

The North Cattaraugus study area serves approximately 15,200 customers. There are seven 13.2kV feeders, five of which are fed via two 115-13.2kV transformers at the Valley substation.

The remaining two 13.2kV feeders are fed from a 34.5-13.2kV transformer at the Price Corners substation. There are also twenty-one 4.8kV feeders, all supplied by 34.5-4.8kV transformers at various area substations. There are seven 34.5kV sub-transmission lines that provide supply for the 34.5-4.8kV transformers. A minimal number of industrial customers are supplied directly from the 34.5kV system. There are several NYSEG substations and municipal electric departments supplied from the 34.5kV system.

The Chautauqua North study area serves approximately 22,900 customers. There are 10 4.8kV feeders, which are all fed from 34.5-4.8kV transformers. There are also 20 13.2kV distribution feeders with all but one fed by 115-13.2kV transformers at various substations in the area. One 13.2kV feeder is supplied by a 34.5-13.2kV transformer at the West Portland substation. There are also eight 34.5kV sub-transmission lines which provide the supply to the 34.5-4.8kV step-down transformers in the area.

The Chautauqua South study area serves approximately 17,900. Customers are supplied by 20 4.8kV delta feeders, all of which are fed from 34.5-4.8kV transformers. There are four 13.2kV feeders with three fed by the Baker Street 115-13.2kV transformer and one fed by the French Creek 34.5-13.2kV transformer. There are five 34.5kV sub-transmission lines that are supplied from Hartsfield and South Dow 115kV substations.

The Erie South study area serves approximately 34,100 customers. The study area includes the City of Buffalo outer harbor area and those areas south with approximately half the feeders served at 13.2kV. The 115kV system supplies the 13.2kV stations. The rest of the feeders operate at 4.8kV or 4.16kV.

The Olean study area serves approximately 18,500 customers. There are 20 distribution feeders that provide service to area customers. There are eight 4.8kV feeders supplied by 34.5-4.8kV transformers at various stations. Of the area's 12 13.2kV feeders, 11 are fed from 115-13.2kV transformers. The remaining single feeder is served from a 34.5-13.2kV transformer at the Vandalia substation.

The Wellsville study area serves approximately 4,400 customers. This study area is a small, rural region located near the Pennsylvania border and is supplied by the 115-34.5kV Andover and Nile substations. There are two 34.5kV supply lines in the area. The load is served by five substations serving nine 4.8kV feeders.

Major Project Table

The following table identifies major projects by spending rationale for this study area.

Table 5-8
Southwest Major Projects

Spending Rationale	Program	System	Distribution Study Area	Project Name	Project Number
Asset Condition	Component Fatigue/Deterioration	Transmission	None	153/154 Str. 308 Access Improve	C090061
				Dunk-Falc 160: 15 Str Replacements	C093930
				Five Mile - Stolle Rd 29 Lam Arm	C093153
				Gard-HH 151-152 T1950-T1280 S ACR	C027425
				Remote end T work for South Eden	C090456
	D/SUB T_Asset Replacement	Sub-T	Fredonia District	W Portland-Hartfield 866 ref 34.5 k	C081637
	D/SUB T_Substation Relay	Distribution	Southwest Region	South Eden Substation IMCS	C086809
	D/SUB T_Sub-T Overhead Line	Sub-T	Angola District	Gard-Dun 141-142 SubT Line Relocate	C078197
			Olean District	Homer Hill-Nile 811-34.5kV	C050326
Customer Request/Public Requirement	D/SUB T_Public Requirements	Distribution	Angola District	Mobile Storage at Angola	C094583
Damage/Failure	Damage/Failure	Transmission	None	Dunkirk-Falconer 160 Str. 122, 124	C090515
				Gard-5 Mile Culvert Replacements	C086795
DER Electric System Access	D/SUB T_Company Owned DER	Sub-T	Stow District	Sherman L863 Energy Storage	C093833
Multi-Value Distribution (MVD)	D/SUB T_Load Relief	Distribution	Olean District	Franklinville Station 24 - New Sub	C093544
	D/SUB T_Substation Power Transformer	Distribution	Fredonia District	Roberts Rd Sta-Replace TB1	C086985
	MVD_AC_System Capacity	Distribution	Southwest Region	New Franklinville Station - LAND	C093616
		Sub-T	Olean District	Dake Hill-W. Salamanca 816-34.5kv	C046469
				Nile-S. Wellsville 812-34.5kV refur	C051765
			Southwest Region	Bagdad-Dake Hill 815-34.5kV refurb.	C050292
				Franklinville - Sub-Transmission Wk	C093618
			Stow District	Sherman-Ashville 863-Ref/Rec	C079096
Multi-Value Transmission (MVT)	MVT Asset Condition	Transmission	None	Gard-Dun 141-142 N Phase Rebuild	C003389
				Gard-Dun 141-142 S Phase Land	C081750
				Gard-Dun 141-142 T1260-70 ACR	C081744
				Gard-Dun 141-142 T1260-70 ACR Senec	C034193
				Homer Hill - 115kV 34.5kV Asset Rpl	C075942
				Moons-Falcnr 175/176 Rebuild	C083216
	MVT Generator Additions	Transmission	None	Dunkirk to Laona 161/162 Rebuild	C088399
Reliability	D/SUB T_Reliability	Distribution	Angola District	Delameter Substation Rebuild	C046536
			Stow District	Baker St - Install 2nd xfmr	C046553

		Sub-T	Stow District	LN863 Findley Lake - French Creek e	C046510
	NERC/NPCC Standards	Transmission	None	Dunkirk-Falconer 160 Rebuild/CCR	C086816
	Performance	Transmission	None	Gardenville Dunkirk 73/74 SNI ACR	C091979
Resiliency	D/SUB T_Targeted Feeder Tie Enhancements	Distribution	Angola District	*Create Full tie F18251 to F18254	C049882
			Southwest Region	Feeder 08_15351 Tie with Feeder 15353	C094407
	Survivability	Transmission	None	Dunkirk - Falconer Resiliency	C084537
System Capacity - NY	Customer Additions	Transmission	None	EV RS - Angola -T-line	C094381
	D/SUB T_Load Relief	Distribution	Angola District	South Eden Greenfield Substation	C046538
			Southwest Region	EV RS - Angola -D-line	C094391
				EV RS - Angola -Sub	C094390
				New Machias Station (Land Purchase)	C093642
				New Machias Substation (Station Wk)	C093639
				South Eden Greenfield New Feeder 1	C048015
				South Eden Greenfield New Feeder 2	C048016
			Stow District	BakerSt 56 Delta Conversion Phase 1	C093874
				W.Chautauqua Dline Work	C055265
		Sub-T	Angola District	South Eden Greenfield Sub-T	C052023

Exhibit 1 - Transmission Capital Investment Plan

Local / Regional	Category	Spending Rationale	Program Name	Project Description	Project Number	FY25	FY26	FY27	FY28	FY29	Total
				Alle Catt II - Transmission Line	C083612	-3	0	2	0	0	-1
				Avangrid Hook Rd Sta 127 I/C (Line)	C087565	457	0	0	0	0	457
				East Point Solar - Stations	C088966	-67	0	0	0	0	-67
				East Point Solar T-Line	C088967	-57	0	0	0	0	-57
				Edic - Support Avangrid Work	C091927	6	0	0	0	0	6
				EHI Segment A Line	C084708	1	1	0	0	0	1
				EHI Segment A Substation	C084709	7	36	5	0	0	47
				EHI Segment B Substations	C084710	1	0	0	0	0	1
				EHI Segment B TLine	C084722	1	1	0	0	0	2
				Empire Cheese- Station Wk	C088696	319	0	0	0	0	319
				Erie Street Remote Ends	C089164	53	0	0	0	0	53
				Farmington Sta 168 Interconnection	C087525	3,155	0	0	0	0	3,155
				Flint Mine Solar - Stations (Trans)	C089045	-58	22	0	0	0	-36
				Flint Mine Solar - T Line	C089044	27	11	0	0	0	37
				Hills Solar - Line	C091941	-5	0	0	0	0	-5
				Hills Solar-Stations	C091940	-18	0	0	0	0	-18
				Horseshoe Solar - Stations	C092784	701	1	0	0	0	702
				Horseshoe Solar T-Line	C092783	527	0	0	0	0	527
			Customer Interconnections	Line tap Bethlehem-Albany Line #18	C089356	163	0	0	0	0	163
				METALLICO 115KV SERVICE	C080973	433	0	0	0	0	433
				[redacted]	C092142	103	224	0	0	0	327
		Customer Request/Public Requirement		[redacted]	C092344	1,822	2,841	0	0	0	4,663
				Number 3 Wind: Stations	C083418	-148	0	0	0	0	-148
				Scriba Volney Series Reactor-Line	C093812	0	0	0	0	0	0
				ScribaVolney Series Reactor-Station	C093816	3	5	0	0	0	8
				Sky High Solar T-Line	C087705	-14	0	0	0	0	-14
				Sky High Solar T-Stations	C087702	-13	0	0	0	0	-13
				St 168 Farmington Remote Ends	C091598	130	0	0	0	0	130
				St. 127 Hook Rd. Remote Ends	C090752	607	0	0	0	0	607
				STAMP 115kV Station	C087952	-663	22	0	0	0	-642
				STAMP Service Lateral	C087953	108	108	0	0	0	216
				Station 56 Interconnect	C085736	2,944	0	0	0	0	2,944
				Station 56 Interconnect Remote End	C089865	146	0	0	0	0	146
				Watkins Rd Solar - Line	C091944	-7	0	0	0	0	-7
				Watkins Rd Solar - Stations	C091942	-10	0	0	0	0	-10
				Wells Enterprises 115kV Taps	C084083	600	0	0	0	0	600
			Customer Interconnections Total			**11,249**	**3,270**	**7**	**0**	**0**	**14,526**
			Public Requirements (additional need)	GCEDC STAMP LINE 112 RELOCATION	C080692	-1	0	0	0	0	-1
				Huntley-Gardenville 79/80 FAA Light	C091994	1,318	0	0	0	0	1,318
				I-81 Viaduct Project DOT Contract 3 Substation	C092532	200	0	0	0	0	200
			Public Requirements (additional need) Total			**1,517**	**0**	**0**	**0**	**0**	**1,517**
			Request from External TO	Dennison - Install DFR	C088691	40	0	0	0	0	40
				Upgrade Mortimer Station	C064567	24	0	0	0	0	24
			Request from External TO Total			**64**	**0**	**0**	**0**	**0**	**64**
		Customer Request/Public Requirement Total				**12,830**	**3,270**	**7**	**0**	**0**	**16,107**
				Ash-Teall 7/8 Corrosion Remd/Impr	C084081	87	0	0	0	0	87
				Bailey Station MEMCO Replacement	C087897	0	95	0	0	0	95
				CP Repl Ash-Temple 9	C084718	87	0	0	0	0	87
				CURTIS STREET - D/F DISCO 18/28	C092879	228	0	0	0	0	228
				Dunkirk-Falconer 160 Str. 122, 124	C090515	1,255	511	0	0	0	1,766
				East Conklin Sta. MEMCO Replacement	C087898	163	94	0	0	0	257
				Elm St Replace FOC	C085162	765	0	0	0	0	765
				Gard-5 Mile 151&152 Culverts 40&42	C087268	31	114	4,365	3,426	0	7,936
				Gard-5 Mile Culvert Replacements	C086795	0	3,000	3,000	3,000	3,000	12,000
				Golah - DF Relay Rplc	C093048	101	0	0	0	0	101
				Greenbush LN15 PT DF	C091140	0	150	0	0	0	150
				Greenbush TB8 DF	C091139	520	195	0	0	0	714
				Homer Hill - DF CB R690	C092855	71	0	0	0	0	71
				Huntley to Kensington Fiber D/F	C087893	1,675	0	0	0	0	1,675
				Lafayette R915 rplc top 5 SF6 leaks	C088905	508	565	0	0	0	1,073
				Leeds Station MEMCO Replacement	C087899	0	361	0	0	0	361
		Damage/Failure	Damage/Failure	Mallory TB-1 Damage Failure	C089594	1,410	2	0	0	0	1,412
				N Creek-Warrensburg5 C-phase DF	C090086	10	0	0	0	0	10

				NYCD Trans Verizon Disconnect	C089938	484	480	480	480	480	2,404
				NYED Trans Verizon Disconnect	C089943	504	480	480	480	480	2,424
				NYWD Trans Verizon Disconnect	C089903	484	480	480	480	480	2,404
				Oswego-Volney 11/12 Spare Arms	C091867	150	0	0	0	0	150
				Reynolds Rd - Rplc AC Station Serv	C088324	566	0	0	0	0	566
				Solvay - Rplc TB#1	C089947	1,410	2	0	0	0	1,412
				Storm Budgetary Blanket - NMPC	C003481	250	250	250	250	250	1,250
				Str# 42 Levitt - Rome Replacement	C083619	399	0	0	0	0	399
				Str. 271 on Line 4-977	C090911	4	0	0	0	0	4
				Telecom Elm St Kensington FOC sub	C089354	0	547	0	0	0	547
				Temple-Peat 10 Corrosion REMD/Impr	C084071	87	0	0	0	0	87
				Trans Station Failure Budget Blankt	C003792	4,000	4,000	4,000	4,000	4,000	20,000
				TransLine D/F Budget Blanket	C003278	5,000	5,000	5,000	5,000	5,000	25,000
				Upstate NY Trans Verizon Disco FY24	C092760	1,363	0	0	0	0	1,363
				Volney Station MEMCO Replacement	C087900	243	489	382	5	0	1,119
			Damage/Failure Total			**21,855**	**16,814**	**18,437**	**17,121**	**13,690**	**87,917**
		Damage/Failure Total				**21,855**	**16,814**	**18,437**	**17,121**	**13,690**	**87,917**
		System Capacity - NY	**TO Led System Studies**	103 and 104 Mountain Lockport	C082394	476	0	0	0	0	476
				130/133 Stations- Huntley	C084015	12	12	76	12	0	113
				130/133 T-Line Reconductor	C079500	284	2,310	10,364	13,094	9,313	35,366
				Access Roads-Mortimer-Pannell 24 25	C093207	0	0	13	6,636	259	6,907
				Battenkill Rebuild: Substation	C093948	0	105	872	504	798	2,279
				Bethlehem sub relay upgrade line #6	C054267	70	98	0	0	0	168
				Capital N AreaStudy Rosa Rd rebuild	C093956	0	0	0	0	122	122
				Dewitt Station 115kV Rebuild	C081783	0	0	105	262	4,199	4,566
				Dewitt Station 115kV Rebuild LAB	C081784	0	0	0	0	3,500	3,500
				Dewitt Station Relocate 115kV Line	C082023	0	0	10	10	39	59
				E. Golah 2nd 115kV Tap	C051829	0	0	0	450	1,000	1,450
				Easements-Line Rebuild MP 24	C093270	0	4,564	6,189	0	0	10,753
				Elm St Relief_Add 4th Xfer	C049594	1,006	0	0	0	0	1,006
				Ephratah Station Rebuild	C093959	0	0	0	105	1,397	1,502
				Frontier 181 ACR/Recond	C060215	240	3,000	6,370	8,190	7,240	25,040
				Katherine St Term 115/23kV Sub	C089019	210	5,480	10,540	15,920	18,914	51,064
				Katherine St Term L145/146 T-Line	C089018	210	4,480	2,496	6,289	6,289	19,764
				Katherine St Term LAND	C089057	2,720	0	0	0	0	2,720
				Land Rights/Acquisition - Tran-NY	CNYT350	75	75	75	75	75	375
				Lasher Rebuild	C093947	0	0	0	0	110	110
				Maplewood #19/#31Reconductoring	C069466	43	0	0	0	0	43
				Mortimer - Elbridge Rebuild	C094023	0	0	0	0	200	200
				Mortimer - Pannell 24/25	C047816	770	1,124	18,310	40,566	40,719	101,489
				Mortimer Stn Wrk 24 25 Line Rebuild	C086307	66	761	93	0	0	919
				Mountain-Lockport 103-104	C085949	58	0	0	0	0	58
				Mplwd 19/31 Mnands Term Equip Upgrd	C078287	4	0	0	0	0	4
				New Watertown 115-13.2kV T - Line	C053155	0	0	245	0	0	245
				Nile Area Reinforcement	C086234	0	0	0	0	100	100
				NY LTC Controller - T Sub	C085943	0	599	856	250	250	1,955
				Packard-Gardenville Station Upgrades	C079506	461	203	101	101	705	1,571
				Pack-Gardenville T-Line Reconfig	C081799	458	196	189	189	4,252	5,285
				Patroon sub relay upgrade line #3 & 5	C054269	70	98	0	0	0	168
				Trans Study Budgetary Blanket NY	C008376	125	125	125	125	125	625
				Whitehall Station Rebuild	C093957	0	0	0	0	122	122
			TO Led System Studies Total			**7,357**	**23,229**	**57,030**	**92,779**	**99,728**	**280,123**
		System Capacity - NY Total				**7,357**	**23,229**	**57,030**	**92,779**	**99,728**	**280,123**
			Asset Condition I&M	NY Inspection Repairs - Capital	C026923	23,024	52,443	38,460	0	0	113,927
				NY Inspection Repairs - Capital NYC	C093942	0	0	7,150	22,516	19,593	49,259
				NY Inspection Repairs - Capital NYE	C093941	0	0	7,150	22,516	19,593	49,259
				NY Inspection Repairs - Capital NYW	C093940	0	0	7,150	22,516	19,593	49,259
				Trans Footer Program I&M Central	C094241	0	967	1,000	1,034	1,067	4,068
				Trans Footer Program I&M East	C094239	0	966	1,000	1,033	1,066	4,065
				Trans Footer Program I&M West	C094240	0	967	1,000	1,033	1,067	4,067
				Trans PIT I&M Central	C094245	0	266	309	309	309	1,193
				Trans PIT I&M East	C094237	0	202	225	225	225	877
				Trans PIT I&M West	C094244	0	332	366	366	366	1,430
				Trans Tower Coating I&M Central	C094243	0	1,700	1,786	1,874	1,968	7,328

				Trans Tower Coating I&M East	C094238	0	1,700	1,786	1,874	1,968	7,328
				Trans Tower Coating I&M West	C094242	0	1,700	1,786	1,874	1,968	7,328
				Wood Pole Replacement Prgm (PIT) NYC	C093908	500	368	368	368	368	1,972
				Wood Pole Replacement Prgm (PIT) NYE	C093910	500	368	368	368	368	1,972
				Wood Pole Replacement Prgm (PIT) NYW	C093909	0	368	368	368	368	1,472
				Asset Condition I&M Total		**24,024**	**62,347**	**70,272**	**78,275**	**69,887**	**304,805**
				153/154 Str. 308 Access Improve	C090061	180	900	20	0	0	1,100
				345KV HUDSON RIV. VIBRATION MITI.	C084213	327	2	0	0	0	329
				Alcoa - Station Service Rplc	C088191	65	0	0	0	0	65
				Alcoa-N.Odgensburg 13 ACR	C093581	0	0	0	0	20	20
				Amsterdam-Rotterdam3/4 Relocation	C081471	1,192	0	0	0	0	1,192
				AMT PS&I - NMPC	C042663	500	500	500	500	500	2,500
				Batavia - Rplc Relays	C088693	129	0	0	0	0	129
				BatteryRplStrategyCo36TxT	C033847	525	524	500	500	500	2,549
				Bethlehem-Albany #18 Reinsulating	C090189	100	0	0	0	0	100
				Brder City-Elbrdge #10/#5 Crossings	C075723	514	3,755	11,479	59	0	15,807
				Breaker T Repl Program 4-69kV NYC	C049258	5	0	0	0	0	5
				Breaker T Repl Program 4-69kV NYW	C049260	90	0	0	0	0	90
				Bristol Hill - Asset Replacement	C084072	0	50	200	5,000	4,003	9,252
				Brockport Taps ACR	C055531	209	6,565	11,281	7,497	0	25,553
				Brockport: Secondary Cables Rplc	C081770	0	200	400	25	0	625
				Churchtown-PV Blue Stores Tap	C091978	0	0	110	330	480	920
				Clay - 345kV relay replacement	C089255	0	0	50	250	949	1,249
				Clay to Wetzel Tap	C069533	2,037	0	0	0	0	2,037
				Coffeen-W.Adams 2 ACR	C091986	0	0	20	120	420	560
				Colony - Asset Replacement	C091871	0	0	75	350	1,000	1,425
				Colton - Battle Hill ACR	C089293	0	0	20	120	240	380
				Colton-Townline 9 ACR	C091987	0	0	20	120	240	380
				Curtis St - Teall #13 ACR	C084496	121	0	0	2,127	14,362	16,610
				Deerfield: Asset Replacements	C081797	360	750	900	4,580	4,780	11,370
				Dennison-Colton 4/5 ACR	C093586	0	0	0	20	120	140
				Dewitt - Rplc 345kV CB R130	C093056	1,636	200	0	0	0	1,836
				Dunk-Falc 160: 15 Str Replacements	C093930	1,171	432	0	0	0	1,603
				Edic - Rplc Bus Supports	C088876	0	75	200	276	291	842
				Edic: Protection Migration	C076214	361	0	0	0	0	361
				Elbridge-Gears Lock 3 Woodard 4 ACR	C084521	0	0	0	0	400	400
				Elbridge-Geres Lock 18/19 ACR	C084522	0	0	0	200	218	418
				Falconer - Rplc GCB R117	C092387	285	0	0	0	0	285
				Feura Bush - N. Catskill 2 ACR	C083073	0	100	100	160	2,320	2,680
				Five Mile - Stolle Rd 29 Lam Arm	C093153	320	2,100	19,370	18,240	2,430	42,460
				Fort Covington: CB R260 work	C081774	0	100	189	15	0	304
				Gard-5 Mile Culvert 24 26 31.2 41.2	C087617	0	0	0	0	3,200	3,200
				Gard-Dunk 73&74 Str Replacements	C087217	11	0	0	0	0	11
				Gardenville 230 - Replace 2 DFRs	C085567	376	0	0	0	0	376
				Gardenville 230 - Trans Foundation	C094460	150	0	0	0	0	150
				Gardenville 230kV - Asset Rplc	C089270	0	0	150	700	8,000	8,850
				Gardenville-Dunkirk 73/74 Shieldwire Replacement	C081669	0	0	0	80	240	320
				Gardenville-HH 151/152 Last Phase	C093901	0	0	0	0	150	150
				Gard-HH 151-152 T1950-T1280 S ACR	C027425	0	150	100	4,000	5,000	9,250
				GCB to VCB Projects	C091903	450	2,500	5,009	5,009	5,009	17,978
				Geres Lock rplc top 5 SF6 leaks	C088906	2	0	0	0	0	2
				GERES LOCK-SOLVAY 2 ACR	C060206	0	0	0	20	120	140
				Golah-NLakeville#116 Priority 2 Str	C086697	90	270	500	3,040	0	3,900
				Greenbush - N Troy Corridor ACR	C094479	125	250	515	6,233	6,715	13,838
				Headson - Rplc 34.5kV assets	C081775	0	0	0	125	850	975
				Homer Hill - West Olean 156 ACR	C060218	0	0	0	0	80	80
				Huntley: 23kV removals	C081777	0	5	0	0	0	5
				Huntley-Lockport 36/37 Ayer Rd ACR	C081670	80	79	6,754	6,600	0	13,513
				Indeck-Spier Str & Foundation Replc	C083672	560	0	0	0	0	560
				Inspection Identified Replac Progra	C082106	300	300	300	300	300	1,501
				Kensington - 23kV replacements	C091035	0	0	0	125	750	875
				Knapp Road Storage Building	C083804	1,552	0	0	0	0	1,552
			Asset Condition	L.Colby-L. Placid 3 ACR	C091989	0	0	20	120	240	380
				Lafayette-Clarks Corner 4-46 Str Replacements	C090652	480	3,110	8,475	405	0	12,470

			Component Fatigue/Deterioration	Lafayette-Clarks. 4 Washout	C091993	610	0	0	0	0	610
				Lake Colby - SVC Replacement	C091042	0	100	1,500	4,000	3,000	8,600
				Lake Colby - Transformer Foundation	C094455	190	0	0	0	0	190
				Leeds - SVC Prot & Cont Repl	C091040	1,209	1,686	0	0	0	2,895
				Leeds Switch sta phase one metering	C091442	38	0	0	0	0	38
				Lindsey Twr 345kV	C091990	50	500	0	0	0	550
				Lockport-Mortimer 113/114 ACR	C081664	309	376	7,940	5,840	170	14,635
				Malone-Lake Colby 5 ACR	C091992	0	0	0	20	120	140
				Marcy-New Scotland #18 ACR	C091977	0	0	0	0	430	430
				Menands - CH	C085165	50	0	0	0	0	50
				Menands Cntrl Bldg & Relay Replcmt	C049601	3,899	2,531	9	0	0	6,439
				Mill St Station Rebuild	C093267	0	45	135	250	1,515	1,945
				Mortimer - Asset Replacement	C093538	0	0	0	0	150	150
				N.Scotland-Feura Bush/Long Lane ACR	C084554	457	6,870	14,091	100	0	21,518
				New Scotland - AC SS Rplc	C088690	536	0	0	0	0	536
				New Scotland - Replace 2 DFRs	C085531	407	0	0	0	0	407
				New Scotland - Rplc GCB R3	C092386	105	0	0	0	0	105
				NEW SCOTLAND R93&R94 ASSET REPLACE	C062752	150	1,600	5,300	4,300	4,000	15,350
				Newtonville Area Study: Maplewood	C091024	50	1,050	1,794	2,088	277	5,259
				Norwood - Asset Repl/Sep	C093552	0	0	0	0	50	50
				NS-Bethlehem #4 SW and Insulators	C092993	149	0	0	0	0	149
				NY OHL Tran Switch Program NYC	C093904	0	1,473	2,970	2,970	2,970	10,383
				NY OHL Tran Switch Program NYE	C093905	96	1,473	2,970	2,970	2,970	10,479
				NY OHL Tran Switch Program NYW	C093902	97	1,473	2,970	2,970	2,970	10,480
				NY Transmission UG Strategy	C084550	0	250	1,000	1,000	5,000	7,250
				Olean Station - Removal	C083415	155	0	0	0	0	155
				Oswego - Lafayette 17	C093022	300	0	0	0	0	300
				Oswego #3 #5 CP Upgrade	C086468	87	0	0	0	0	87
				Packard - Rplc two 115kV OCBs	C079222	254	774	462	0	0	1,491
				Pannell-Geneva 4-4A Road Crossings	C030889	514	2,663	7,288	428	0	10,893
				Porter - Valley/Watkins Str#165&166	C085490	403	0	0	0	0	403
				Porter/Deerfield 8 & 9 Re-Insulate	C086664	0	0	0	0	344	344
				Rem 115kV Deferiet Paper Tap 2	C058560	3	0	0	0	0	3
				Remote end T work for South Eden	C090456	46	747	429	1	0	1,223
				Reynolds Rd - Trans Foundation	C094462	25	175	0	0	0	200
				Rosa Rd - Line #14 Protection	C091039	182	0	0	0	0	182
				Rotterdam - New Scotland 19 ACR	C084588	550	18,977	17,269	300	0	37,096
				S Oswego-Clay #4 T-334 Rebuild	C075544	0	19	592	455	1,365	2,431
				School St - Asset Replacement	C091969	0	0	0	50	750	800
				Schuylerville Retirement - Station	C083967	27	0	103	0	0	130
				Scriba - Line 10 Relay Rplc	C087500	-190	0	0	0	0	-190
				Scriba - Replace 2 DFRs	C085529	20	0	0	0	0	20
				Scriba - Rplc CB R200	C093255	25	500	672	0	0	1,197
				Scriba sta phase one metering	C091438	38	0	0	0	0	38
				Scriba-Volney 20/21 Emerg. Lam Arm	C094039	700	0	0	0	0	700
				Scriba-Volney 20/21 Lam Arm/ACR	C093004	95	215	200	200	19,450	20,160
				Seneca Term - 23kV Asset Rplc	C089269	0	0	0	0	125	125
				Solvay: Asset Replacement	C079463	100	750	7,500	7,500	4,001	19,851
				Spier-Queensbury #17 ACR	C060211	100	60	60	399	580	1,199
				Spier-Queensbury #5 115kV ACR	C060210	100	60	220	378	440	1,198
	Local Rates			Spier-Rotterdam 2 Re-insulate	C081676	9,250	0	0	0	0	9,250
				Station 078: Asset Replacement	C081792	0	150	950	9,000	15,000	25,100
				Terminal House B - Roof Replacement	C092805	25	0	0	0	0	25
				Terminal Station D-25 cycle retire	C092497	1	0	0	0	0	1
				Thompson-N Troy Corridor ACR	C081667	125	250	515	6,233	6,715	13,838
				Ticonderoga 2-3 T5810-T5830 ACR	C039521	893	0	0	0	0	893
				Tilden R180 brkr rplc	C091887	243	0	0	0	0	243
				Tran Sub Spare 345kV CB	C093864	10	10	900	0	0	920
				Transmission Substation PS	C093611	0	300	300	2,000	2,000	4,600
				Trinity Pumping Plant Refurb	C091980	1,240	0	0	0	0	1,240
				T-XFR Spare 115kV-23kV 50MVA	C081732	0	600	600	1,400	0	2,600
				Walck Road - Rplc GCB R102	C092389	682	0	0	0	0	682
				Warrensburg-Schofield Rd 10 Str Repl	C086755	0	0	130	390	500	1,020
				Whitehall R7 brkr rplc	C091886	6	0	0	0	0	6

				Worst Performing Circuits - NY	C084553	0	2,500	5,000	5,000	5,000	17,499
				Yahnundasis - Trans Foundation	C094461	25	175	0	0	0	200
				Yahnundasis: Asset Replacement	C081794	360	600	1,500	8,430	8,980	19,870
				Youngman Terminal - Asset Rplc	C079465	0	125	900	6,000	6,000	13,025
				Component Fatigue/Deterioration Total		**39,098**	**71,995**	**153,527**	**141,919**	**158,799**	**565,338**
			Failure Trend	LPRO-2100 to 4000 relay swap NY-W	C088205	22	0	0	0	0	22
				McIntyre-Colton 8 Rein. 275-359	C086662	0	0	0	4,675	0	4,675
				Niagara-Lockport 101 Reinsulating	C094300	539	0	0	0	0	539
				Failure Trend Total		**561**	**0**	**0**	**4,675**	**0**	**5,236**
			Asset Condition Total			**63,683**	**134,342**	**223,799**	**224,869**	**228,686**	**875,379**
				Access Rd- Lockport-Batavia 112	C089590	321	4,376	264	0	0	4,961
				Ash St. Station 34.5kV Rebuild	C088028	0	0	0	150	700	850
				Ballston Rebuild: Substation	C093946	0	0	105	1,397	504	2,006
				Balmat Station TB 1 & 2	C091767	0	0	0	0	110	110
				Boonville-Rome 3/4 ACR	C093585	0	0	0	0	20	20
				Brown Falls Taylorville Rebuild	C093951	0	0	0	20	120	140
				Colton Substation Rebuild	C091862	0	0	0	75	600	675
				Colton-BF 1-2 T3140-T3150 ACR	C036164	0	0	0	110	330	440
				Easement-Gardenville-Dunkirk Rebuil	C076951	26	23	7	0	0	56
				Elm St #2 TRF Asset Replacement	C069426	1,487	422	0	0	0	1,909
				Gard-Dun 141-142 N Phase Rebuild	C003389	27,145	7,827	0	0	0	34,972
				Gard-Dun 141-142 S Phase Land	C081750	55	70	1,010	324	10	1,469
				Gard-Dun 141-142 T1260-70 ACR	C081744	598	718	2,218	3,300	20,748	27,582
				Gard-Dun 141-142 T1260-70 ACR Senec	C034193	1,250	2,000	3,000	2,139	0	8,389
				Gardenville-Rebuild Line Relocation	C030084	147	0	0	0	0	147
				Geres Lock - CH replacement	C090822	0	0	50	300	4,000	4,350
				Greenbush Station Rebuild (base project)	C079224	360	1,510	960	5,257	22,283	30,370
				Greenbush T-Line	C091535	120	210	480	1,434	5,983	8,227
				Greenbush-Knickerbocker 15 Rebuild	C069540	0	0	80	240	480	800
				Homer Hill - 115kV 34.5kV Asset Rpl	C075942	680	500	1,913	6,756	2,035	11,884
				Huntley-Gardenville 38/39 Rebuild	C075543	0	200	150	3,100	3,900	7,350
Local				Inghams-E. Springfield #7 Rebuild	C060209	0	0	0	50	120	170
				Land-Greenbush Substation Refurb	C092621	528	0	0	0	0	528
				Lockport-Batavia 107 Rebuild	C086920	140	146	583	14,998	44,594	60,461
				Lockport-Batavia 108 Rebuild	C086921	140	145	585	15,007	44,724	60,601
			MVT Asset Condition	Lockport-Batavia 112 T1510 ACR	C003422	7,142	23,367	22,636	22,005	539	75,688
		Multi-Value Transmission (MVT)		Mohican - Control House	C080755	1,666	1,333	0	0	0	2,999
				Mohican - Rplc 115kV, 34.5kV assets	C053133	2,245	5,784	3,858	3,074	6	14,967
				Moons-Falcnr 175/176 Rebuild	C083216	0	120	360	530	22,790	23,800
				North Troy - 34.5kV refurb/rebuild	C079223	0	106	900	900	8,000	9,906
				Oswego: 345kV Asset Sep/Repl	C076218	1,932	10	0	0	0	1,941
				Quaker-Sleight Road #13 Rebuild	C060219	0	0	110	330	520	960
				Reynolds Road - Asset Replacement	C077616	0	125	900	1,200	8,000	10,225
				Rotterdam Asset Replacement	C034850	0	0	125	800	950	1,875
				S.Oswego-Curtis 10 Rebuild	C091983	0	0	0	20	120	140
				SCHUYLER Sub	C093968	0	0	110	1,466	529	2,105
				SE Batavia-Golah 119 ACR	C060217	295	145	220	220	220	1,100
				Seneca #5 TRF asset Replace	C069427	0	0	658	288	376	1,322
				Sleight Rd-Auburn #3 Rebuild	C075566	0	0	20	120	120	260
				South Oswego-Geres Lock 9 Rebuild	C089292	0	0	80	120	240	440
				Spier Falls: Asset Rplc/Separation	C081788	98	100	1,000	7,436	4,998	13,632
				Spier-Mohican/Spier-Butler Rebuild	C089289	0	0	20	120	420	560
				St Johnsville-Marshville ACR	C091976	0	0	0	150	450	600
				Teall Ave - Asset Replacement	C086893	0	0	125	1,300	1,800	3,225
				Teall-Carr 6 Rebuild	C091985	20	120	300	510	10,064	11,014
				Terminal - Relocation CH	C086695	0	194	0	0	0	194
				Terminal Station Relocation	C076242	7,257	6,550	3,828	500	0	18,135
				Terminal Station Relocation_TLine	C080493	1,526	3,261	0	0	0	4,787
				Tilden: Asset Replacement	C081785	273	490	4,238	5,438	4,220	14,659
				Whitman - Transformer Replacement	C091870	0	0	0	75	350	425
				Woodlawn Transformer Replacement	C051986	7,424	423	0	0	0	7,848
				MVT Asset Condition Total		**62,874**	**60,274**	**50,893**	**101,258**	**215,974**	**491,273**
			MVT Reliability	West Sweden Station	C094417	0	0	320	2,280	5,120	7,720
				West Sweden Station TLine	C094416	0	0	170	850	1,230	2,250

		MVT Reliability Total			0	0	490	3,130	6,350	9,970
		Multi-Value Transmission (MVT) Total			62,874	60,274	51,383	104,388	222,324	501,243
	Reliability	NERC/NPCC Standards	Conductor Clearance - NY Program	C048678	7,560	0	0	0	0	7,560
			Conductor Clearance - NYC Program	C093896	0	8,317	10,333	9,025	10,333	38,008
			Conductor Clearance - NYE Program	C093895	0	8,317	10,333	9,025	10,333	38,008
			Conductor Clearance - NYW Program	C093879	0	8,317	10,123	0	10,333	28,773
			Dunkirk-Falconer 160 Rebuild/CCR	C086816	0	50	210	12,950	0	13,210
		NERC/NPCC Standards Total			7,560	25,000	31,000	31,000	31,000	125,560
		Performance	145 Reinsulating	C090713	36	0	0	0	212	248
			149/150 Reinsulating	C090704	0	0	0	0	1,148	1,148
			183/184 Reinsulating	C091302	3	0	0	0	0	3
			Andover - Asset Removal	C093427	9	0	0	0	0	9
			Cicero Substation T-Line Taps	C093003	90	90	1,352	1,145	0	2,676
			Clay -Animal Deterrent	C086838	57	0	0	0	0	57
			Dunkirk Falconer Cummins Sw Ring	C093023	0	840	0	0	0	840
			Falconer Ph2 re-insulate Str103-299	C088552	146	0	0	0	0	146
			Gardenville - Erie 54 ACR	C091984	0	0	80	240	490	810
			Gardenville Dunkirk 73/74 SNI ACR	C091979	0	80	240	530	3,980	4,830
			G-ville-Ohio Street 146 reinsulate	C090714	0	0	0	0	245	245
			Gville-Seneca 81/82 Reinsulate	C090820	0	0	0	0	717	717
			Homer Hill Andover 157 Switches	C091888	965	0	0	0	0	965
			Kensington - Gardenville 44/45 ACR	C091982	0	0	80	240	490	810
			L301 Regulator - Phillips Rd Locat	C088772	340	0	0	0	0	340
			Lasher Rd LN1 first 3 spans rcndctr	C093224	0	0	0	140	560	700
			Levitt-Rome #8 IA Follow Up	C091193	0	0	0	180	480	660
			Mobile Capacitor Bank	C081351	479	0	0	0	0	479
			Mohican - Butler #18 RC MOD	C092944	200	0	0	0	0	200
			New bkr 25H Sawyer Sub Bus A2	C090662	0	0	0	0	500	500
			Nile Hill Road Switch Replacement	C090854	186	0	0	0	0	186
			Osprey Mitigation/Protection NYC	C093922	167	167	167	167	202	870
			Osprey Mitigation/Protection NYE	C093920	167	167	167	167	201	869
			Osprey Mitigation/Protection NYW	C093916	166	166	166	166	201	865
			Packard-Huntley 77 78 Reinsulation	C093019	180	3,460	6,660	0	0	10,300
			Patroon LN5 Distance Relay Upgrade	C092280	0	0	15	175	41	230
			RC-MOD Clay - Dewitt 5	C085062	0	60	0	0	0	60
			RC-MOD Huntley - Lockport 36 & 37	C085239	30	3,288	0	0	0	3,318
			RC-MOD Mohican - Schaghicoke	C085082	0	588	0	0	0	588
			RC-MOD Packard-Gardenville 181&182	C085238	30	1,839	0	0	0	1,869
			RE-43 Auto Recloser CB	C092108	17	17	0	0	0	34
			Reinsulate Adams Packard 187 & 188	C090604	1,340	0	0	0	0	1,340
			Sleight Rd-State 3-971 Str.586-590	C090516	658	0	0	0	0	658
			Smart Fault Indicator Program-NY	C082281	50	500	3,000	3,000	3,000	9,550
			Spier- Queensbury LN 5 & 17 Rebuild	C093172	0	0	0	100	500	600
			St. Campus-Menands #15 UG Replmt	C088133	125	600	3,000	3,000	400	7,125
			Sta 33 Supply Sub Sawyer Bkr 32H A1	C090658	0	0	0	0	383	383
			Sta 47 Supply Sub Sawyer Bkr 24H B1	C090657	0	0	0	0	383	383
			UG 115kV Lake Placid to Republic	C093843	0	0	0	0	300	300
			Walck Switches	C090685	170	217	0	0	0	387
			Zimmerman Switches	C090686	170	217	0	0	0	387
		Performance Total			5,780	12,296	14,927	9,249	14,433	56,685
		Reliability Total			13,340	37,295	45,927	40,249	45,433	182,244
		Climate Vulnerability	C. Incremental $$ Xtreme Wind CCVS	C094263	0	117	89	89	223	518
			C. Spares for Climate Change	C093521	0	500	0	0	0	500
			E. Incremental $$ Xtreme Wind CCVS	C094262	0	354	491	703	342	1,890
			E. Spares for Climate Change	C093522	0	500	0	0	0	500
			Tran Sub Flood Mitigation - Central	C093529	0	0	150	3,650	2,300	6,100
			Tran Sub Flood Mitigation - East	C093527	0	0	0	0	150	150
			Tran Sub Flood Mitigation - West	C093528	0	0	150	1,950	1,250	3,350
			Transmission Sub CCRP XFR Central	C094225	0	143	428	143	0	714
			Transmission Sub CCRP XFR East	C094224	0	143	515	48	0	706
			Transmission Sub CCRP XFR West	C094226	0	143	95	48	0	286
			W. Incremental $$ Xtreme Wind CCVS	C094264	0	5,321	7,705	6,400	5,814	25,240
			W. Spares for Climate Change	C093520	0	500	0	0	0	500
		Climate Vulnerability Total			0	7,722	9,624	13,030	10,078	40,454

		Resiliency	Damage Prevention	Station 78-R405,R105,R292 Rpl	C090819	172	0	0	0	0	172
			Damage Prevention Total			**172**	**0**	**0**	**0**	**0**	**172**
			Survivability	Add LN160 bypass around W. Ashville	C091079	13	217	0	0	0	230
				Clay - Dewitt Resiliency (RC-Mod)	C089588	25	450	0	0	0	475
				Dewitt-Tilden Resiliency	C084535	179	446	4,186	6,292	350	11,452
				Dunkirk - Falconer Resiliency	C084537	520	2,868	506	0	0	3,894
				Dunkirk - Laona 161+162- New Rd	C091104	40	240	0	0	0	280
				Huntley - Lockport (Getzville)	C084538	241	429	1,260	1,511	0	3,441
				North Troy - Hoosick Resiliency	C084532	11	0	0	0	0	11
				S Oswego - LHH Resiliency	C084544	200	500	100	0	0	800
				Teall - Oneida Resiliency	C084541	2,021	0	0	0	0	2,021
				Yahnundasis - Porter Resiliency	C084545	50	450	0	0	0	500
			Survivability Total			**3,300**	**5,599**	**6,052**	**7,803**	**350**	**23,104**
			System Recovery	Mobile Xfrmr 115-34.5-23kV 25MVA	C090270	1,740	0	0	0	0	1,740
				Mobile Xfrmr 115-34.5-23kV 50MVA	C090264	2,083	0	0	0	0	2,083
				Obsolete/failed comm proc rplc NY-C	C090757	314	156	0	0	0	470
				Obsolete/failed comm proc rplc NY-E	C090759	364	151	0	0	0	515
				Obsolete/failed comm proc rplc NY-W	C090755	213	103	0	0	0	316
				Spare NYC 115/46kV,20/33MVA Xfrmr	C090949	584	778	0	0	0	1,362
				Spare NYE Trans Xfrmrs	C090951	4,018	959	4,829	0	0	9,806
				Spare NYW Trans Xfrmrs	C090950	2,588	0	2,123	0	0	4,710
			System Recovery Total			**11,903**	**2,147**	**6,952**	**0**	**0**	**21,002**
		Resiliency Total				**15,376**	**15,468**	**22,628**	**20,833**	**10,428**	**84,732**
		Communications/ Control Systems	EMS/SCADA	DENNISON RFL GARD 8000 UPGRADE	C092851	7	0	0	0	0	7
				EMS/RTU FOR DSCADA TRANS	C081809	235	0	0	0	0	235
				RTUs M9000 protocol upgrades Trans	C069437	1,832	0	0	0	0	1,832
			EMS/SCADA Total			**2,074**	**0**	**0**	**0**	**0**	**2,074**
			Telecom	Batavia - Telecom Ring Protection	C085421	240	520	1,200	2,300	2,350	6,610
				Colton - Telecom Migration	C088869	0	64	120	0	0	184
				Dark Fiber IRU	C087765	163	0	0	0	0	163
				DMX projects	C084525	398	2,000	10	0	0	2,408
				DMX Tran Program NY Central	C093636	0	0	400	400	400	1,200
				DMX Tran Program NY East	C093635	0	0	400	400	400	1,200
				DMX Tran Program NY West	C093638	0	0	400	400	400	1,200
				FAS, ProVision, Server, KVM	C089548	280	642	772	772	1,500	3,966
				Gardenville - Telecom Migration	C088867	0	200	60	0	0	260
				Microwave Radio Network NY Central	C093820	0	0	400	1,200	1,200	2,800
				Microwave Radio Network NY East	C093818	0	0	400	1,200	1,200	2,800
				Microwave Radio Network NY West	C093819	0	2,250	500	1,200	1,200	5,150
				Nokia 1830PSS DWDM Syracuse Metro	C089112	144	0	0	0	0	144
				Nokia 1830PSS LH DWDM Upgrade Cent	C088866	0	500	1,000	1,000	1,000	3,500
				Nokia 1830PSS LH DWDM Upgrade East	C088954	0	500	1,000	1,000	1,000	3,500
				Nokia 1830PSS LH DWDM Upgrade West	C088135	0	500	1,000	1,000	1,000	3,500
				Porter - Telecom Migration	C088870	0	181	60	0	0	241
				Radio Comms Systems T Central	C093841	0	0	400	1,400	1,400	3,200
				Radio Comms Systems T East	C093840	0	750	500	1,400	1,400	4,050
				Radio Comms Systems T West	C093842	0	1,300	500	1,400	1,400	4,600
				Reynolds Road - Telecom Migration	C088875	0	50	274	0	0	324
				Satellite Project NY Central	C093846	0	40	40	40	40	160
				Satellite Project NY East	C093845	0	40	40	40	40	160
				Satellite Project NY West	C093849	0	40	40	40	40	160
				Spier Falls ADSS Fiber to Sodeman	C091012	15	200	1,185	0	0	1,400
				Taylorville - Telecom Migration	C088871	0	102	60	0	0	162
				Telecom Akwesasne-Dennison MW	C088758	54	81	0	0	0	135
				Telecom Boonville-Porter FOC	C088655	125	69	107	250	750	1,301
				Telecom BrownsFalls-Taylorville FOC	C088701	162	100	81	500	250	1,093
				Telecom Colton-Browns Falls FOC	C088756	280	928	99	0	0	1,307
				Telecom Dennison-Lawrence FOC	C088757	184	334	600	0	0	1,119
				Telecom DS0 Central - BALMAT SUB	C089023	265	0	0	0	0	265
				Telecom DS0 Central - FITZPATRICK	C089063	36	0	0	0	0	36
				Telecom DS0 Central - Marcy 345kV	C089061	13	0	0	0	0	13
				Telecom DS0 Central - Marcy 765kV	C089059	13	0	0	0	0	13
				Telecom DS0 Central - Nine Mile RSC	C089058	9	0	0	0	0	9
				Telecom DS0 Central - Pebble Hill	C090485	4	0	0	0	0	4

				Telecom DS0 East - LEEDS SUB	C089050	10	0	0	0	0	10
				Telecom DS0 West - ANDOVER SUB	C089054	275	0	0	0	0	275
				Telecom DS0 West - FALCONER SUB	C089030	59	0	0	0	0	59
				Telecom DS0 West - ISCHUA SW	C089031	13	0	0	0	0	13
				Telecom DS0 West - NEW WALDEN	C089037	7	0	0	0	0	7
				Telecom FOC Alabama-Telegraph-SS	C094074	0	200	600	2,500	2,500	5,800
				Telecom FOC Eastover-Bearswamp	C094121	0	0	0	200	300	500
				Telecom FOC Gardenville-WRCC	C090924	300	2,100	500	0	0	2,900
				Telecom FOC Lockport-Mountain	C090931	0	0	0	800	4,000	4,800
				Telecom FOC Packard-NewRdSC-Niagara	C090945	200	400	1,800	1,800	700	4,900
				Telecom FOC Packard-Sawyer	C090921	0	0	150	900	4,100	5,150
				Telecom FOC SE Batavia-BSC-N.Leroy	C094076	0	200	500	2,000	1,900	4,600
				Telecom FOC Seneca-Gardenville	C090919	0	200	500	1,100	400	2,200
				Telecom FOC Sweden-Brock-Mortimer	C094075	0	300	1,200	3,000	3,000	7,500
				Telecom FOC WRCC-Lockport	C090935	500	2,200	2,800	1,100	0	6,600
				Telecom Gardenville-Arcade FOC	C088699	149	110	125	201	600	1,185
				Telecom Geres Lock-Woodard FOC	C088700	174	25	300	600	0	1,099
				Telecom Lawrence - Colton FOC	C088879	92	69	263	750	0	1,174
				Telecom Reynolds-North Troy FOC	C088657	100	86	116	500	800	1,602
				Telecom T Central Dark Fiber	C091295	569	1,315	2,058	2,058	2,000	7,999
				Telecom T East Dark Fiber	C091301	2,251	1,257	2,000	2,000	2,000	9,508
				Telecom T West Dark Fiber	C091294	1,812	1,315	2,058	2,058	2,000	9,242
				Telecomm Migration - NY Central	C083767	91	1,765	4,000	5,500	5,500	16,856
				Telecomm Migration - NY East	C083766	100	1,783	4,000	5,500	5,500	16,883
				Telecomm Migration - NY West	C083768	91	1,765	4,000	5,500	5,500	16,856
				Upgrade Comm Equip Verizon Retireme	C069570	175	250	0	0	0	425
				Verizon DS0 Replace - East	C086735	602	1,350	1,350	1,350	1,350	6,004
				Verizon DS0 Replace-Central	C086772	855	1,350	1,350	1,350	1,350	6,257
				Verizon DS0 Replace-West	C086771	716	1,350	1,350	1,350	1,350	6,117
				Woodard - Telecom Migration	C088868	0	100	120	0	0	220
			Telecom Total			**11,526**	**30,883**	**42,789**	**58,059**	**61,821**	**205,078**
		Communications/Control Systems Total				**13,600**	**30,883**	**42,789**	**58,059**	**61,821**	**207,152**
		Non-Infrastructure	**General Equipment**	IHC Capital Small Tools 5210-T NY	C054605	100	100	100	100	100	500
				LMR Land Mobile Radio Sys-Trans	C086663	200	200	200	200	200	1,000
			General Equipment Total			**300**	**300**	**300**	**300**	**300**	**1,500**
		Non-Infrastructure Total				**300**	**300**	**300**	**300**	**300**	**1,500**
Local Rates Total						**211,215**	**321,875**	**462,299**	**558,597**	**682,411**	**2,236,397**
CLCPA Ph1 in the Rate Case	**Multi-Value Transmission (MVT)**	**MVT Reliability**		Browns Falls Taylorville Ln Upgra	C082926	64	0	0	0	0	64
				Colton Terminal Equipment	C082927	10	0	0	0	0	10
				Colton-Browns Falls Line Upgrades	C082928	82	0	0	0	0	82
				Flat Rock Upgrades - Line	C087428	0	235	0	0	0	235
				Malone Par	C084542	5,525	890	0	0	0	6,415
				MVT Rott 69kV Rebuild & New TB	C082180	4,835	2,696	3	0	0	7,534
				MVT Rott 69kV Rebuild & New TB - CH	C092550	1,661	0	0	0	0	1,661
				MVT Scho/Sch Int-Rott 18/4 Rebld	C082182	3,835	3,437	0	0	0	7,273
			MVT Reliability Total			**16,012**	**7,259**	**3**	**0**	**0**	**23,274**
		Multi-Value Transmission (MVT) Total				**16,012**	**7,259**	**3**	**0**	**0**	**23,274**
	CLCPA Ph1 in the Rate Case Total					**16,012**	**7,259**	**3**	**0**	**0**	**23,274**
CLCPA Ph1 In the Rate Case Distribution	**Multi-Value Transmission (MVT)**	**MVT Asset Condition**		Hoosick - Replace Bank 1 & relays	C053132	8,885	544	0	0	0	9,429
			MVT Asset Condition Total			**8,885**	**544**	**0**	**0**	**0**	**9,429**
		Multi-Value Transmission (MVT) Total				**8,885**	**544**	**0**	**0**	**0**	**9,429**
	CLCPA Ph1 In the Rate Case Distribution Total					**8,885**	**544**	**0**	**0**	**0**	**9,429**
CLCPA Ph 1 Supplemental	**Multi-Value Transmission (MVT)**	**MVT Generator Additions**		Dunkirk to Laona 161/162 Rebuild	C088399	569	30,669	12,256	0	0	43,493
				Fenner Wind Sta - LN3,8 THERMAL UPG	C088424	100	0	0	0	0	100
				Inghams/Rotterdam Circuit Rebuild	C088402	15,733	61,915	132,352	75,599	49,195	334,793
				Marshville 115kV Rebuild	C088329	1,357	3,495	1,394	542	522	7,310
				Meco 115kV Rebuild	C088414	3,948	9,337	1,825	0	0	15,110
				Mortimer 109 bay 115kV Upgrade	C088632	242	1,068	74	0	0	1,385
				Nile Hill Switch - 115kV THERMAL UP	C089452	652	0	0	0	0	652
				Nile Station - 115kV THERMAL UPGRAD	C088427	20	0	0	0	0	20
				North Leroy - 115kV THERMAL UPGRADE	C088428	327	15	0	0	0	342
				Rotterdam LN10 &LN 12 THERM UPG	C088429	203	0	0	0	0	203
				Saltsman Rd New 5 Breaker Ring	C091495	2,544	2,997	6,632	6,445	105	18,722
				SE Batavia - Golah LN119 Rebuild	C088631	9,398	11,618	22,793	21,018	13,089	77,916

				Tilden Sta - LN18 THERM UPG	C088430	25	0	0	0	0	25
				Tilden-Cortland LN18 Clearance	C088415	3,275	0	0	0	0	3,275
				MVT Generator Additions Total		**38,392**	**121,113**	**177,325**	**103,605**	**62,911**	**503,346**
			MVT Reliability	Golah Sub rebuild	C051831	3,197	5,262	11,002	2,450	0	21,911
				MVT Reliability Total		**3,197**	**5,262**	**11,002**	**2,450**	**0**	**21,911**
		Multi-Value Transmission (MVT) Total				**41,589**	**126,375**	**188,328**	**106,055**	**62,911**	**525,257**
	CLCPA Ph 1 Supplemental Total					**41,589**	**126,375**	**188,328**	**106,055**	**62,911**	**525,257**
	EV Highway	**System Capacity - NY**	**Customer Additions**	EV RS - Angola -T-line	C094381	80	420	1,270	4,880	3,500	10,150
				EV RS - Chittenango-T-line	C094386	90	420	1,500	9,500	8,760	20,270
				EV RS - Dewitt-T-line	C094383	80	420	1,270	4,550	4,330	10,650
				EV RS - Pattersonville-T-line	C094389	90	840	1,150	2,120	1,250	5,450
				EV RS - Pembroke (Flying J)-T-line	C094378	80	420	1,200	2,210	1,500	5,410
			Customer Additions Total			**420**	**2,520**	**6,390**	**23,260**	**19,340**	**51,930**
		System Capacity - NY Total				**420**	**2,520**	**6,390**	**23,260**	**19,340**	**51,930**
	EV Highway Total					**420**	**2,520**	**6,390**	**23,260**	**19,340**	**51,930**
	Tran Base CLCPA Dependent	**Asset Condition**	**Component Fatigue/Deterioration**	Browns Falls - Asst Sep/Rplc	C081427	6,155	3,426	2,308	0	55	11,944
				Clay Substation 115kV Spare Bay Tap	C084077	1,425	0	0	0	0	1,425
				Mallory 115kV Breakers	C084074	900	3,245	1,105	0	0	5,250
				Mallory Rd. Station CH	C091198	638	826	0	0	0	1,464
			Compenet Fatigue/Deterioration Total			**9,118**	**7,497**	**3,413**	**0**	**55**	**20,084**
		Asset Condition Total				**9,118**	**7,497**	**3,413**	**0**	**55**	**20,084**
		Reliability	**Performance**	CLCPA Marshville Temporary Sub	C093978	969	233	0	0	0	1,203
			Performance Total			**969**	**233**	**0**	**0**	**0**	**1,203**
		Reliability Total				**969**	**233**	**0**	**0**	**0**	**1,203**
		Resiliency	**Survivability**	Easement/Land-Indian River New 115kV	C092101	1,201	998	0	0	0	2,199
				Indian River-Lyme Junction Line	C082190	13,602	22,157	11,495	4,958	0	52,212
				Indian River-Lyme Junction Station	C082192	5,604	3,274	5,529	1,234	0	15,641
			Survivability Total			**20,407**	**26,429**	**17,024**	**6,192**	**0**	**70,052**
		Resiliency Total				**20,407**	**26,429**	**17,024**	**6,192**	**0**	**70,052**
		System Capacity - NY	**TO LED System Studies**	Malone Station Rebuild_Tline	C059673	115	995	1,828	0	0	2,938
				Malone Substation Rebuild_T_Sub	C069306	896	6,528	8,282	3,233	0	18,939
				Recond Cortland Clarks Corners	C053141	13	388	2,061	0	0	2,462
			TO Led System Studies Total			**1,023**	**7,912**	**12,171**	**3,233**	**0**	**24,339**
		System Capacity - NY Total				**1,023**	**7,912**	**12,171**	**3,233**	**0**	**24,339**
		Multi-Value Transmission (MVT)	**MVT Asset Condition**	Boonville - Rebuild Assc Tline work	C082488	385	515	2,308	4,162	2,115	9,484
				Boonville - Rebuild CH	C082487	0	2,479	1,859	1,859	0	6,198
				Boonville Rebuild	C049903	2,405	6,435	13,889	25,845	20,442	69,016
				Coffeen - Asset Replace CH	C087772	970	970	1,293	0	0	3,234
				Coffeen - Asset Rplc T-line	C089326	104	3,331	3,059	0	0	6,494
				Coffeen: Asset Replacments	C081787	4,689	19,595	21,513	4,546	0	50,342
				Gloversville - Marshville #6 Refurb	C081458	0	70	768	13,174	18,970	32,982
				Land-Coffeen Substation Expansion	C092843	700	0	0	0	0	700
				LightHH 115kV CH	C073996	1,604	1,433	0	0	0	3,036
				LightHH 115kV Yard Repl & cntrl hs.	C031662	7,176	14,437	12,504	582	0	34,700
				LightHH Trans Lines Reconnect	C073997	588	9,324	8,670	0	0	18,582
				Lockport - Rebuild T-line work	C085990	81	1,308	11,820	14,711	4,994	32,914
				Lockport Sub Rebuild CH	C073991	131	250	1,413	336	180	2,310
				LockportSubstationRebuildCo36TxT	C035464	726	3,660	12,160	13,064	12,106	41,716
				Mortimer-Golah #110 ACR Rebuild	C060220	7,414	7,987	16,454	13,685	246	45,785
				Mortimer-Golah 109-69kV Rebuild	C081474	7,329	7,916	35,538	1,550	0	52,332
				New Manheim - Assoc Line work	C060240	4,822	6,419	1,844	289	0	13,374
				New Manheim Control House	C074000	2,290	1,805	0	0	0	4,095
				New Manheim Greenfield project	C050917	24,282	18,435	8,337	1,139	0	52,193
				Oneida - Sub Rebuild T-line	C084674	196	1,239	1,235	214	0	2,883
				Oneida - Substation Rebuild CH	C087290	0	1,899	0	0	0	1,899
				Oneida Substation Rebuild	C034443	4,226	9,407	5,334	228	0	19,196
				Rochester Airport Cable Refurb	C080543	181	0	0	0	0	181
				South Oswego: 115kV Asset Rplc	C081781	0	0	108	146	490	743
			MVT Asset Condition Total			**70,300**	**118,913**	**160,107**	**95,528**	**59,543**	**504,391**
		Multi-Value Transmission (MVT) Total				**70,300**	**118,913**	**160,107**	**95,528**	**59,543**	**504,391**
	Tran Base CLCPA Dependent Total					**101,817**	**160,985**	**192,716**	**104,952**	**59,598**	**620,069**
Local Total						**379,937**	**619,558**	**849,735**	**792,864**	**824,260**	**3,466,355**
		System Capacity - NY	**TO Led System Studies**	Transmission EV Fleet	C089362	0	5,348	10,697	10,697	28,525	55,267

Local Supplemental	EV Fleet		TO Led System Studies Total			0	5,348	10,697	10,697	28,525	55,267
		System Capacity - NY Total				0	5,348	10,697	10,697	28,525	55,267
		EV Fleet Total				0	5,348	10,697	10,697	28,525	55,267
Local Supplemental Total						0	5,348	10,697	10,697	28,525	55,267
Regional	CLCPA Ph2A	Multi-Value Transmission (MVT)	MVT Generator Additions	Alcoa Station Upgrades	C089994	18	0	0	0	0	18
				Black River - LHH Rebuild	C089996	20,939	5,943	50,358	95,003	60,235	232,479
				Black River - Taylorville Rebuild	C089997	15,123	48,421	52,051	25,478	36,067	177,141
				Black River Substation Upgrades	C090000	1,392	159	155	3,160	128	4,995
				Boonville - Porter Rebuild	C090003	16,695	7,919	4,379	85,847	75,238	190,079
				Boonville Substation CLCPA Upgrades	C090005	4,830	1,001	1,821	6,123	15,780	29,555
				Clay Substation CLCPA Upgrades	C090006	1,293	184	2,748	76	0	4,302
				CLCPA - Dennison Station Upgrade	C090026	9	0	0	0	0	9
				Coffeen - Black River Rebuild	C090008	3,184	1,237	3,645	34,882	0	42,947
				Coffeen - East Watertown Rebuild	C090009	4,060	1,316	3,337	14,189	24,650	47,552
				Coffeen - Lyme Junction Rebuild	C090010	3,302	1,391	26,125	10,681	0	41,499
				Coffen Synchronous Condensers	C090023	25,811	3,050	40,243	28,959	33	98,096
				Colton - Malone #3 Rebuild	C090024	5,038	16,757	38,849	695	0	61,339
				Colton Station Term Equip Upgrade	C090025	224	300	0	0	0	524
				East Ave Station - Greenfield	C090027	2,764	1,717	2,545	7,639	191	14,856
				Lighthouse Hill - Clay Rebuild	C090028	20,599	81,734	90,374	1,315	0	194,022
				Lighthouse Hill - S. Oswego Rebuild	C090029	15,614	5,024	41,703	79,178	44,539	186,058
				Maiden Lane station - Greenfield	C090031	5,397	11,109	5,321	0	0	21,827
				Marshville New Substation	C090032	13,540	10,895	24,795	10,003	1,336	60,570
				Marshville TLine New Substation	C090046	351	3,180	4,821	3,993	578	12,924
				McIntyre - Colton DLR	C090047	680	1	0	0	0	681
				Middle Road Sta - Six Breaker Ring	C090051	4,984	10,403	8,151	0	0	23,539
				South Oswego Station Upgrades	C090052	548	79	1,544	26	0	2,196
				Taylorville - Boonville Rebuild	C090050	20,103	59,114	100,051	41,711	0	220,979
				Taylorville Sta - BAAH Greenfield	C090053	27,374	29,897	53,797	17,089	14,254	142,411
			MVT Generator Additions Total			213,872	300,833	556,814	466,048	273,030	1,810,598
		Multi-Value Transmission (MVT) Total				213,872	300,833	556,814	466,048	273,030	1,810,598
	CLCPA Ph2A Total					213,872	300,833	556,814	466,048	273,030	1,810,598
	FERC	Customer Request/Public Requirement	Customer Interconnections	EHI Edic Upgrades	C086312	51	0	0	0	0	51
				Reconductoring 30 Line for EHI	C086313	100	0	0	0	0	100
			Customer Interconnections Total			151	0	0	0	0	151
		Customer Request/Public Requirement Total				151	0	0	0	0	151
	FERC Total					151	0	0	0	0	151
	Priority Transmission Project	Multi-Value Transmission (MVT)	MVT Generator Additions	Smart Path Connect - T Line	C088956	153,319	66,292	12,645	0	0	232,257
			MVT Generator Additions Total			153,319	66,292	12,645	0	0	232,257
		Multi-Value Transmission (MVT) Total				153,319	66,292	12,645	0	0	232,257
	Priority Transmission Project Total					153,319	66,292	12,645	0	0	232,257
	Interregional Intertie	Multi-Value Transmission (MVT)	Customer Interconnections	Interregional Intertie - Line	C094532	0	0	5,000	5,000	40,000	50,000
			Customer Interconnections Total			0	0	5,000	5,000	40,000	50,000
		Multi-Value Transmission (MVT) Total				0	0	5,000	5,000	40,000	50,000
	Interregional Intertie Total					0	0	5,000	5,000	40,000	50,000
Regional Total						367,343	367,125	574,460	471,048	313,030	2,093,006
Grand Total						747,280	992,031	1,434,892	1,274,609	1,165,816	5,614,628

Exhibit 2 – Sub-Transmission Capital Investment Plan

Local / Regional	Category	Spending Rationale	Program Name	Project Description	Project Number	FY25	FY26	FY27	FY28	FY29	Total
		Customer Request/Public Requirement	3rd Party Attachments	NYC SubT Middle Mile Make Ready	C093889	875	376	0	0	0	1,251
				NYE SubT Middle Mile Make Ready	C093891	875	376	0	0	0	1,251
			3rd Party Attachments Total			**1,750**	**752**	**0**	**0**	**0**	**2,502**
			Blanket	CNY Sub Trans-Line New Business.	CNC0071	10	10	10	11	11	52
				CNY Sub Trans-Line Public Require.	CNC0072	10	10	10	11	11	52
				ENY Sub Trans-Line New Business.	CNE0071	10	10	10	11	11	52
				ENY Sub Trans-Line Public Require.	CNE0072	10	10	10	11	11	52
				NY Central Sub T Line Third Party.	CNC0078	10	10	10	11	11	52
				NY East Sub T Line Third Party.	CNE0078	10	10	10	11	11	52
				NY West Sub T Line Third Party.	CNW0078	10	10	10	11	11	52
				WNY Sub Trans-Line New Business.	CNW0071	10	10	10	11	11	52
				WNY Sub Trans-Line Public Require.	CNW0072	10	10	10	11	11	52
			Blanket Total			**90**	**90**	**90**	**95**	**98**	**464**
			New Business	34.5kV Tap Adirondack Beverage	C091410	300	0	0	0	0	300
				Adirondack Station 23kV Ext v2	C090891	102	0	0	0	0	102
				CenTrio/ SU Capital work	C092087	51	461	0	0	0	512
				CenTrio/Syracuse University SU	C091325	365	0	0	0	0	365
				DEC Kenco Scotia- Rosa #6 Line	C089950	4	0	0	0	0	4
				Empire Cheese - Sub-T Line Wk	C088698	70	0	0	0	0	70
				TxD RESERVE for New Business Commer	C046913	0	1,000	1,500	2,400	3,400	8,300
			New Business Total			**892**	**1,461**	**1,500**	**2,400**	**3,400**	**9,653**
			Public Requirements	AHET Subtransmission Relocations	C080483	175	0	0	0	0	175
				PIN#7780.09 Route 12E Bridge	C092582	-95	0	0	0	0	-95
				Public Requirements Total		**80**	**0**	**0**	**0**	**0**	**80**
		Customer Request/Public Requirement Total				**2,812**	**2,303**	**1,590**	**2,495**	**3,498**	**12,699**
		Damage/Failure	Blanket	CNY Sub Trans-Line Damage Failure.	CNC0073	505	520	535	568	585	2,713
				ENY Sub Trans-Line Damage Failure.	CNE0073	516	532	548	581	598	2,775
				WNY Sub Trans-Line Damage Failure.	CNW0073	2,800	2,884	2,970	3,059	3,151	14,863
			Blanket Total			**3,820**	**3,935**	**4,053**	**4,208**	**4,334**	**20,351**
			Damage Failure Other	34.5kV Regulator Blanket	C086927	350	404	700	442	0	1,896
				D/F Attica-Weathersfield 209 LnRegs	C093621	105	0	0	0	0	105
			Damage Failure Other Total			**455**	**404**	**700**	**442**	**0**	**2,001**
		Damage/Failure Total				**4,275**	**4,339**	**4,753**	**4,650**	**4,334**	**22,352**
		System Capacity - NY	Load Relief	Buffalo Station 98 - Sub-T	C091810	0	0	8	30	150	188
				Buffalo Station 99 - Sub-T	C091811	0	0	0	8	30	38
				Cable 33S extension	C089210	381	0	0	0	0	381
				Cleveland Sub-T	C093654	0	0	0	300	0	300
				Constantia Sub-T	C093652	0	300	0	0	0	300
				Delmar 34.5kV Reconfiguration	C083917	34	417	374	26	13	864
				Glens Falls-Mohican 12 Reconductor	C085322	20	0	0	0	0	20
				Hancock 2 SubT Tap	C093670	0	0	0	150	150	300
				Katherine St TERM STA 23KV SubT	C089020	210	12,480	15,350	34,874	34,874	97,789
				LHH - Mallory 34.5 kV #22 Line Reg.	C073226	32	591	0	0	0	623
				Malone Area Study Sub-T Line	C085514	143	522	698	0	0	1,363
				MITS Sub	C093716	0	130	500	2,269	2,266	5,165
				South Eden Greenfield Sub-T	C052023	20	1,149	368	1	0	1,538
				W Chautauqua 34.5/4.8kV Mini Sub	C091269	0	0	50	525	0	575
			Load Relief Total			**839**	**15,589**	**17,349**	**38,184**	**37,483**	**109,444**

System Capacity - NY Total				**839**	**15,589**	**17,349**	**38,184**	**37,483**	**109,444**
		#7Ln from Glens Falls to Bay St ACR	C094077	0	0	17	39	292	348
		Ashley - Glens Falls 5 ACR	C094096	0	0	0	0	58	58
		Attica-Wethersfield 209 34.5 kV ref	C081705	0	0	150	1,491	340	1,981
		Avenue A - Bethlehem 10 ACR	C094093	0	0	0	21	50	71
		Ballston-Shore Rd 8-34.5 kV	C046457	225	0	0	0	0	225
		BALMAT-FOWLER NO. 27 (23kV) Refurb	C084262	105	189	0	0	0	294
		Boonville - Rebuild SubT assc Line	C081425	11	10	336	425	226	1,009
		Brighton - Tilden 37 Refurb	C094131	0	0	0	64	149	213
		Brockport Taps ACR (Sub-T Relo.)	C092339	96	243	53	35	0	427
		Browns Falls - Asst R/S SubT line	C081426	308	114	76	207	0	705
		Browns Fls - Newton Fls 22 Refurb	C094119	0	0	20	46	415	481
		Carthage-Taylorville 21/22/26-23kv	C046436	603	0	0	0	0	603
		Cement Mt - Cambridge 2 ACR	C094072	0	52	120	904	181	1,257
		Chestertown-Schroon 3 34.5kV Refurb	C084009	50	50	1,009	0	0	1,109
		Coffeen Asset Replacement SubT Relo	C089520	0	288	485	56	0	829
		Colvin Ave - Partridge St 2 ACR	C094089	0	0	0	9	21	30
		Colvin-Partridge #2 Reconductor	C092870	0	0	0	500	1,722	2,222
		Cortland 20 refurbish 34.5 kV	C081639	16	1,200	0	0	0	1,216
		Cortland 21 34.5 kv Refurbish	C081646	0	39	507	0	0	546
		Cortland 23 34.5 kv Refurbish	C081647	0	38	750	0	0	788
		Crescent-North Troy 20 T1 replace	C087209	218	0	0	0	0	218
		Deferiet - Herrings 27	C094147	0	0	0	11	250	261
		Delaware Ave - Bethlehem 14 ACR	C094087	0	0	0	18	41	59
		Delmar Elsmere 34.5 kV Tap Rebuild	C081606	375	0	0	0	0	375
		East Oswegatchie - Fonda 21 Refurb	C094146	0	0	0	0	1	1
		Emeryville - Loomis 2 Refurb	C094062	0	5	12	89	18	124
		Gasport-Telegraph 312 34.5kV Refurb	C084019	0	0	70	902	0	972
		Golah-N. Lakeville 216-217 refurb	C084016	0	75	1,072	0	0	1,147
		HCB Bldg#3 - 35kV Services-Replace	C091829	134	0	0	0	0	134
		Headson - Minoa 33 Refurb	C094129	0	0	0	46	107	153
		Headson - Pebble Hill 26 Refurb	C094122	0	0	0	19	45	64
		Henry St - Glens Falls 3 ACR	C094097	0	0	0	0	13	13
		Lake Clear - Tupper Lake 38 Refurb	C094142	0	0	0	104	2,058	2,162
		Latham - Newtonville 11 ACR	C094086	0	0	0	13	30	43
		Mallory-Cleveland 31 34.5kV Refurb	C084194	0	64	1,733	0	0	1,797
		McIntyre-Hammond 24 23kV refurb	C084261	184	400	333	0	0	918
		McIntyre-Hammond 24 reloc/refurb	C075852	84	3,164	2,976	0	0	6,224
		Mill Street - Black River 21 Refurb	C094148	0	0	0	30	709	739
		Mine Rd - Colony 28 Refurb	C094128	0	0	0	31	750	781
		N.Akron-Attica 225 34.5kV Refurb	C084020	0	100	1,644	466	0	2,210
		N.Lakeville-Hemlock 224 Line Regs	C094356	0	15	20	640	0	675
	Asset Replacement	N.Lakeville-Richmond 226 Line Regs	C094354	15	20	640	0	0	675
		N.Leroy-Attica 208 Line Regs	C094358	0	0	15	20	640	675
		Norfolk - Norwood 21 Refurb	C094144	0	0	0	28	562	590
		North Lakeville-Ridge 218 refurb	C084014	0	200	760	7,880	5,420	14,260
		NY SubT PS&I Line Activity	CD00772	55	250	250	250	250	1,055
		NYC Sub-T PIT Inspection Prog	C094456	0	335	349	356	184	1,224
		NYE Sub-T PIT Inspection Prog	C094457	0	335	349	356	184	1,224

Local	Local Rates	Asset Condition		NYW Sub-T PIT Inspection Prog	C094458	0	335	349	356	184	1,224
				Oakfield-Caledonia 201 34.5 Refurb	C083975	0	100	2,160	346	0	2,606
				Ohio St Duct Bank Interconnetion	C081704	0	0	700	0	0	700
				Partridge-Avenue A #5 - Reconductor	C092869	0	0	0	500	644	1,144
				Pebble Hill-Tilden 32 34.5kV Refurb	C083971	0	0	140	1,700	1,600	3,440
				Ransomville-Phillips 402 refurb	C084189	0	70	70	601	1,400	2,141
				Raquette Lake Padmount Xfmer	C082716	473	622	35	0	0	1,130
				Rotterdam-Scotia Road 32 34.5	C046455	16	1,100	0	0	0	1,116
				Snyders Lake - Hoag 9 ACR	C094083	0	0	62	145	1,090	1,297
				Solvay - Harris 20 Refurb	C094143	0	0	0	0	39	39
				South Oswego - Varick 207 Refurb	C094063	0	10	24	177	35	246
				Spier Falls - Ballston 3 11 12 10 & 5 ACR	C084068	75	75	1,703	0	0	1,853
				State St - Canton ATC 21 Refurb	C094118	0	0	7	17	124	148
				Station 79 Sub-T Relocation	C084920	59	260	163	156	10	647
				Sub-T Highway Crossing NYC	C093861	0	90	126	126	130	472
				Sub-T Highway Crossing NYE	C093856	0	90	126	126	130	472
				Sub-T Highway Crossing NYW	C093873	0	90	126	126	130	472
				SubT Line Ins Repl Program West	C078518	1,174	1,331	883	1,106	1,195	5,689
				SubT Line Ins. Repl Program Central	C078621	1,296	1,494	982	1,296	1,296	6,364
				SubT Line Ins. Repl Program East	C078624	756	776	467	1,000	1,000	3,999
				Taylorville - Int Sol 23 Refurb	C094145	0	0	0	43	853	896
				Teall 23 34.5kV Refurb	C084196	43	398	0	0	0	440
				Telegraph-Medina 302 &303 34.5 kV	C081634	102	60	96	3,791	4,293	8,341
				Telegraph-Medina 303 Lvl 2 Str Repl	C094285	102	60	0	0	0	161
				Theresa - S Philadelphia 21 Refurb	C094064	0	37	86	647	129	899
				Varick-Bristol Hill 202-34.5kv	C046460	362	0	0	0	0	362
				W Ashville-Ashville 868 and 863 tap	C081141	0	189	0	0	0	189
				W Portland-Hartfield 866 ref 34.5 k	C081637	0	105	1,327	0	0	1,432
				Warrensburg-Chestertown 6-refurb	C084012	75	75	1,703	0	0	1,853
				Warrensburg-Ft Gage 8- 34.5kVrefurb	C084013	60	241	411	0	0	713
				Western 34.5kV Spare Line Regs	C094289	260	0	0	0	0	260
				Woodard 24 Refurb	C094066	0	0	62	145	1,090	1,297
				Woodard-Ash27 Partial UG OH portion	C086593	858	1,258	0	0	0	2,116
				Woodard-Ash27 Partial UG UG portion	C086594	761	1,354	0	0	0	2,115
				Woodlawn - Karner 14 ACR	C094082	0	0	23	53	399	475
			Asset Replacement Total			**8,949**	**17,404**	**25,579**	**27,513**	**30,487**	**109,932**
			Blanket	CNY Sub Trans-Line Asset Replace.	CNC0075	806	1,031	1,056	1,081	1,124	5,098
				ENY Sub Trans-Line Asset Replace.	CNE0075	129	266	337	345	359	1,436
				WNY Sub Trans-Line Asset Replace.	CNW0075	343	554	564	587	610	2,658
			Blanket Total			**1,279**	**1,850**	**1,957**	**2,013**	**2,094**	**9,193**
			Inspection & Maintenance	I&M - NC Sub-T Line Work From Insp.	C026166	2,512	2,514	2,500	3,000	3,000	13,525
				I&M - NE Sub-T Line Work From Insp.	C026165	2,500	2,500	2,500	3,000	3,000	13,500
				I&M - NW Sub-T Line Work From Insp.	C026167	2,499	2,500	2,500	3,000	3,000	13,499
			Inspection & Maintenance Total			**7,511**	**7,513**	**7,500**	**9,000**	**9,000**	**40,524**
			Sub T UG Cable Replacement	10E Cable Replacement	C081761	738	507	975	35	0	2,255
				CenTrio/ SU Paper lead UG cable	C092086	799	0	0	0	0	799
				Rotterdam #34 #36 34.5kV Cable Repl	C077065	626	0	0	0	0	626
				South Mall #38 Cable Replacement	C084664	460	0	0	0	0	460
				Station 126 34 and 36H UG Taps	C083185	299	0	0	0	0	299

Sub T UG Cable Replacement Total				**2,922**	**507**	**975**	**35**	**0**	**4,439**
Sub-T Overhead Line	Barker-Lyndonville 301-34.5kV	C052511		0	0	40	1,600	2,100	3,740
	Carthage-N. Carthage-Deferiet 23kv	C046435		0	106	1,255	49	0	1,409
	Cottrell Paper Tap 11-34.5kv	C046443		0	399	0	0	0	399
	Deerfield-whitesboro 26-46kv	C046459		200	200	435	750	3,933	5,517
	Eagle Harbor - Albion 305 ACR	C094092		0	0	0	55	129	184
	Elbridge-Jewitt 31-34.5kV refurb	C050959		1	1	188	2,122	465	2,777
	Gard-Dun 141-142 SubT Line Relocate	C078197		2,535	51	0	0	0	2,586
	Homer Hill - Ceres 809 ACR	C094127		0	0	0	0	92	92
	Homer Hill-Nile 811-34.5kV	C050326		160	400	2,283	0	0	2,843
	Kenmore-Winspear 630/631-ref	C050318		57	2,154	0	0	0	2,211
	LHH-Mallory 22-34.5kv	C046441		100	1,700	1,700	0	0	3,500
	LighthouseHill Sub-TLine Relocation	C074322		500	25	10	0	0	535
	Maplewood-Menands 17/18 d/c-34.5kv	C046432		25	573	0	0	0	598
	Mountain - Sanborn 404 ACR	C094120		0	0	0	0	59	59
	Queensbury-Henry Street 14-34.5kv	C046442		517	3,468	901	31	0	4,917
	Ridge - Shaleton 610 ACR	C094125		0	0	0	0	69	69
	Schuylerville Retirement - Sub-T	C050323		45	52	52	940	0	1,089
	Shaleton-Ridge 610 Station 207 Tap	C046779		522	1,216	0	0	0	1,738
	Solvay/Woodard-Ash st 27&27&28- 34.	C046439		0	1,055	0	0	0	1,055
	Station 126 taps 34h/36h-23kv	C046450		387	0	0	0	0	387
	Sub-T Footer Program	C094490		0	1,080	1,134	1,191	1,250	4,655
	Sub-T Tower Painting	C094489		0	1,350	1,418	1,489	1,562	5,819
	Sub-T PIT Wood Pole Repl Program	C093868		58	226	233	242	250	1,009
	Tonawanda 601-604 23kV - T22&T23	C067266		504	1,500	1,000	0	0	3,004
	Tonawanda Lines 601-604-23kv	C046451		65	2,550	2,295	0	0	4,910
	Tonawanda Lines 622-624-23kv	C046452		84	505	1,250	570	0	2,409
	Trenton-Whitesboro 25 46kV	C058579		0	0	2,215	4,453	0	6,668
	Union-Ausable Forks 36-46kV ref	C050320		0	1,589	97	0	0	1,686
	Union-Lake Clear 35-46kV refurb	C050324		0	0	90	1,628	2,083	3,801
	W. Milton Tap-34.5kV new line	CD00898		614	3,736	1,000	0	0	5,350
	Walden - Ledyard 702 ACR	C094090		0	0	35	82	611	728
	Waterport - Albion 306 ACR	C094059		0	34	79	594	119	826
	Waterport Hydro - Waterport 311 ACR	C094095		0	0	0	1	1	2
	Willowdale Tap 26H 33H 34H ACR	C048911		53	546	1,051	0	0	1,651
	Woodard 24 Refurb N.-I90	C060445		29	840	0	0	0	869
	Woodard 29-34.5kv	C046473		140	1,800	1,733	0	0	3,673
	Yahnundasis-Clinton 24 -46kv	C046449		0	1,619	2,313	0	0	3,931
	Yahnundasis-Clinton 27 46kV	C055143		0	406	0	0	0	406
	Youngstown - Mountain 401 ACR	C094088		0	0	44	102	762	908
Sub-T Overhead Line Total				**6,596**	**29,180**	**22,848**	**15,899**	**13,485**	**88,008**
Asset Condition Total				**27,256**	**56,456**	**58,859**	**54,460**	**55,065**	**252,096**
	Alder Creek Substation - Sub-T	C093793		0	0	0	300	0	300
	Bagdad-Dake Hill 815-34.5kV refurb.	C050292		0	0	1,371	1,340	0	2,711
	Bristol Hill-Phoenix 23-34.5kv	C046474		0	79	1,651	0	0	1,730
	Buffalo 23kV Reconductor - Huntley	C079450		0	0	50	2,501	4,924	7,475
	Buffalo 23kV UG Cable replacement	C092587		250	4,000	6,000	8,000	8,000	26,250
	Buffalo Station 122 Rebuild - 23kV.	CD00780		152	0	0	0	0	152
	Buffalo Station 25 Rebuild - 23 kV	C036457		0	0	0	40	150	190

		Multi-Value Distribution (MVD)	MVD System Capacity	Buffalo Station 30 - Rebuild - 23kV	C015755	0	40	150	150	0	340
				Buffalo Station 31 Rebuild - 23 kV	C046942	190	57	132	65	0	443
				Buffalo Station 32 Rebuild - 23 kV	C036460	73	44	0	0	0	117
				Buffalo Station 34 Rebuild - 23 kV	C046944	0	0	0	0	40	40
				Buffalo Station 35 Rebuild - 23 kV	C046933	0	0	0	40	150	190
				Buffalo Station 38 Rebuild - 23 kV	C046935	144	16	0	0	0	160
				Buffalo Station 41 Rebuild - 23 kV	C046937	0	0	0	0	40	40
				Buffalo Station 45 Rebuild -SubT	C090772	0	0	10	30	150	190
				Buffalo Station 51 Rebuild - 23 kV	C046926	0	0	10	30	150	190
				Buffalo Station 53 Rebuild - 23 kV	C046928	95	0	0	0	0	95
				Buffalo Station 68 Rebuild - 23 kV	C046930	0	0	0	0	39	39
				Central Utica Boutique Sub Sub-T	C093809	0	300	0	0	0	300
				Chestertown-N. Creek 2 Rebuild OH	C093773	0	0	0	0	72	72
				Chestertown-N.Creek #2 Rebuild UG	C093775	0	0	0	0	19	19
				Dake Hill-W. Salamanca 816-34.5kv	C046469	0	280	1,444	1,541	0	3,266
				Dorwin SubT Tap	C093674	0	1	0	0	0	1
				Eagle Bay Sub-T Tap	C093630	0	0	0	0	300	300
				Franklinville - Sub-Transmission Wk	C093618	0	0	0	0	1,000	1,000
				Lyndonville-Medina 301-34.5kV	C052512	0	0	0	38	90	128
				Manheim 46kV relocation	C074485	208	2,377	138	20	0	2,743
				Mexico SubT Tap	C093645	0	300	0	0	0	300
				Minoa D-Line	C093707	0	0	0	20	1,630	1,650
				Nile-S. Wellsville 812-34.5kV refur	C051765	0	100	233	1,745	349	2,427
				Phillips-Barker 301-34.5kv	C046465	104	890	3,955	0	0	4,949
				Phillips-Telegraph 304-34.5kv	C046466	62	2,358	2,734	3,571	968	9,693
				Sherman-Ashville 863-Ref/Rec	C079096	1,492	0	0	0	0	1,492
				Sonora Way - Replace Sub-T Poles	C091243	119	0	0	0	0	119
				Station 162- SubT Cable	C090659	86	0	0	0	0	86
				Waterport tap 301-34.5kV	C052515	0	0	105	105	5,234	5,444
				W'burg-Chestertown 6 Reconductor OH	C093770	0	0	0	50	2,623	2,673
				W'burg-Chestertown 6 Reconductor UG	C093771	0	0	0	26	100	126
				White Lake Sub-T Tap	C093610	0	0	0	0	300	300
			MVD System Capacity Total			**2,975**	**10,842**	**17,983**	**19,611**	**26,327**	**77,738**
		Multi-Value Distribution (MVD) Total				**2,975**	**10,842**	**17,983**	**19,611**	**26,327**	**77,738**
		Reliability	Blanket	CNY Sub Trans-Line Reliability.	CNC0076	375	519	530	555	577	2,555
				ENY Sub Trans-Line Reliability.	CNE0076	132	269	273	282	293	1,250
				WNY Sub Trans-Line Reliability.	CNW0076	239	379	387	402	418	1,826
			Blanket Total			**746**	**1,167**	**1,191**	**1,239**	**1,288**	**5,631**
			Reliability	25H Cable - New UG Cable Bkr Pos and Riser Pole	C090677	50	800	0	0	0	850
				Amsterdam 69 KV reconfig and LB SWs	C049299	540	296	0	0	0	836
				Boonville - Raquette Lake Fiber	C090818	0	27	250	7,418	5,118	12,813
				Corliss Park Tap Work for Station	C083661	81	0	0	0	0	81
				LN863 Findley Lake - French Creek e	C046510	0	0	100	2,641	0	2,741
				Ludwig-Gardenville 704 34.5kV reloc	C085043	61	19	112	695	1,194	2,082
				Newtonville Area Study: Sub-T	C091460	5	5	5	5	5	25
				Sta 33 Supply Line: Transfer Cable 9H to a Sawyer Bus A1	C090668	43	0	0	0	0	43
				Sta 47 Supply Line: Transfer Cable 36H to Sawyer Bus B1	C090678	43	0	0	0	0	43
				Sub-T Osprey Mitigation Program NY	C093876	15	160	248	343	532	1,298
				SubT Smart Fault Indicator Prog NYC	C093976	0	80	80	230	230	620

				SubT Smart Fault Indicator Prog NYE	C093974	0	80	80	230	230	620
				SubT Smart Fault Indicator Prog NYW	C093977	0	80	80	230	230	620
			Reliability Total			**837**	**1,548**	**955**	**11,793**	**7,539**	**22,672**
			Substation Flood Mitigation	Union Falls Flood Mitigation_SubT	C068247	0	1,229	29	0	0	1,258
			Substation Flood Mitigation Total			**0**	**1,229**	**29**	**0**	**0**	**1,258**
		Reliability Total				**1,584**	**3,944**	**2,174**	**13,031**	**8,828**	**29,561**
		Resiliency	**FLISR**	South St. FLISR	C084414	50	495	0	0	0	545
			FLISR Total			**50**	**495**	**0**	**0**	**0**	**545**
			Sub-T Automation	Sub-T Automation Program NYC	C090712	1,850	7,844	8,333	9,490	4,467	31,984
				Sub-Transmission Automation Program - West	C084935	1,850	7,844	8,333	9,490	4,467	31,984
				Sub-Transmission Automation Program - East	C089150	1,850	7,844	8,333	9,490	5,900	33,417
			Sub-T Automation Total			**5,550**	**23,532**	**24,999**	**28,470**	**14,833**	**97,384**
			Targeted Feeder Tie Enhancements	Targeted fdr ti Cuyler-Delphi SubT	C094341	0	0	0	0	1	1
			Targeted Feeder Tie Enhancements Total			**0**	**0**	**0**	**0**	**1**	**1**
			Climate Vulnerability	Sub-T Line CCRP Projects - NYC	C094136	0	483	1,000	1,000	1,033	3,517
				Sub-T Line CCRP Projects - NYE	C094135	0	483	1,000	1,000	1,033	3,517
				Sub-T Line CCRP Projects - NYW	C094134	0	483	1,000	1,000	1,033	3,517
			Climate Vulnerability Total			**0**	**1,450**	**3,000**	**3,000**	**3,100**	**10,550**
		Resiliency Total				**5,600**	**25,477**	**27,999**	**31,470**	**17,934**	**108,480**
		DER Electric System Access	**Company Owned DER**	Akwesasne Line 26 Energy Storage	C093829	0	0	100	250	8,500	8,850
				North Lakeville L218 Energy Storage	C093807	0	100	250	8,500	19,000	27,850
				Sherman L863 Energy Storage	C093833	0	0	100	250	8,500	8,850
			Company Owned DER Total			**0**	**100**	**450**	**9,000**	**36,000**	**45,550**
		DER Electric System Access Total				**0**	**100**	**450**	**9,000**	**36,000**	**45,550**
	Local Rates Total					**45,341**	**119,050**	**131,157**	**172,902**	**189,470**	**657,920**
Local Totals						**45,341**	**119,050**	**131,157**	**172,902**	**189,470**	**657,920**
Grand Total						**45,341**	**119,050**	**131,157**	**172,902**	**189,470**	**657,920**

Exhibit 3 – Distribution Capital Investment Plan

Local / Regional	Category	Spending Rationale	Program Name	Project Description	Project Number	FY25	FY26	FY27	FY28	FY29	Total
			3rd Party Attachments	NYC Dist Middle Mile Make Ready	C093886	3,000	4,000	0	0	0	7,000
				NYE Dist Middle Mile Make Ready	C093888	3,000	4,000	0	0	0	7,000
				NYS Broadband Expansion	C075964	345	0	0	0	0	345
			3rd Party Attachments Total			**6,345**	**8,000**	**0**	**0**	**0**	**14,345**
			Blanket	Cent NY-Dist-3rd Party Attch Blnkt	CNC0022	1,000	1,030	1,061	1,093	1,126	5,309
				Cent NY-Dist-Meter Blanket	CNC0004	653	672	693	735	757	3,509
				Cent NY-Dist-New Bus-Comm Blanket.	CNC0011	6,750	7,610	7,827	9,650	9,879	41,716
				Cent NY-Dist-New Bus-Resid Blanket	CNC0010	13,250	14,820	15,253	16,298	16,757	76,378
				Cent NY-Dist-Public Require Blankt	CNC0013	2,000	3,149	3,936	6,234	7,806	23,125
				Cent NY-Dist-St Light Blanket.	CNC0012	1,322	1,362	1,403	1,488	1,488	7,063
				East NY-Dist-3rd Party Attch Blnkt	CNE0022	1,000	1,030	1,061	1,093	1,126	5,309
				East NY-Dist-Meter Blanket	CNE0004	2,700	2,781	2,864	2,950	3,038	14,332
				East NY-Dist-New Bus-Comm Blanket.	CNE0011	5,750	7,198	8,545	10,941	11,636	44,070
				East NY-Dist-New Bus-Resid Blanket.	CNE0010	10,550	11,730	12,070	13,020	14,381	61,750
				East NY-Dist-Public Require Blankt	CNE0013	972	1,002	1,032	1,094	1,126	5,225
				East NY-Dist-St Light Blanket.	CNE0012	721	743	765	811	811	3,852
				Land and Land Rights NY Central.	CNC0091	1,300	1,339	1,379	1,421	1,463	6,902
				Land and Land Rights NY East	CNE0091	1,300	1,339	1,379	1,421	1,463	6,902
				Land and Land Rights NY West	CNW0091	800	800	800	800	800	4,000
				NiMo Meter Purchases	CN03604	2,335	2,500	2,660	2,822	2,906	13,223
				NiMo Transformer Purchases	CN03620	90,000	104,080	106,243	108,493	110,833	519,649
				West NY-Dist-3rd Party Attch Blnkt	CNW0022	1,000	1,030	1,061	1,093	1,126	5,309
				West NY-Dist-Meter Blanket	CNW0004	839	864	890	945	973	4,512
				West NY-Dist-New Bus-Comm Blanket.	CNW0011	5,250	6,065	6,235	8,010	8,690	34,249
				West NY-Dist-New Bus-Resid Blanket.	CNW0010	6,750	7,610	7,826	9,649	10,378	42,212
				West NY-Dist-Public Require Blankt	CNW0013	684	704	726	770	793	3,676
				West NY-Dist-St Light Blanket.	CNW0012	4,344	4,635	4,775	5,065	5,065	23,884
			Blanket Total			**161,270**	**184,094**	**190,481**	**205,893**	**214,420**	**956,157**
			Meter Installations	AMI - NY Electric Central	C087167	33,347	34,877	7,182	122	0	75,529
				AMI - NY Electric East	C083340	33,381	34,877	7,182	122	0	75,562
				AMI - NY Electric West	C087168	33,381	34,877	7,182	122	0	75,562
			Meter Installations Total			**100,109**	**104,632**	**21,545**	**367**	**0**	**226,652**
		Customer Request/Public Requirement	New Business	13852 Adirondack Beverage	C091371	200	0	0	0	0	200
				Birch Ave 51 - Route 9N Conversion	C053127	661	0	0	0	0	661
				EV Charger Ripley NY	C093337	118	0	0	0	0	118
				High River Solar - Dist Stations	C089483	3	0	0	0	0	3
				LED Decorative Central NY	C084981	610	0	0	0	0	610
				LED Decorative East NY	C084979	627	627	0	0	0	1,254
				LED Decorative West NY	C084982	506	0	0	0	0	506
				New LED Central NY	C069886	1,482	2,508	2,508	2,508	0	9,006
				New LED East NY	C069947	1,317	2,022	2,022	2,022	2,022	9,405
				New LED West NY	C069927	1,430	2,440	2,440	2,440	2,440	11,190
				Philips Medical 34.5kV service Dist	C089390	1	0	0	0	0	1
				Reserve for New Business Commercial	C046920	0	8,000	9,000	12,000	16,000	45,000
				Reserve for New Business Residentia	C046921	0	7,000	8,000	11,000	14,000	40,000
				Sonora Livonia 3763 Conversion CSD	C093798	1,258	0	0	0	0	1,258
				TaylorILLCTroyNY	C092253	62	0	0	0	0	62
				TroySand&GravelMiddleGroveNY	C091296	1	0	0	0	0	1
				Upgrade F10552 for new cust load	C081502	610	0	0	0	0	610
			New Business Total			**8,886**	**22,597**	**23,970**	**29,970**	**34,462**	**119,885**
			Public Requirements	EHI Segment B D-Stations	C085574	-10	3	0	0	0	-7
				GeorgeCowanSchroon LakeNY	C089850	1	0	0	0	0	1
				I-81 Viaduct Project DOT Contract 3 Distribution	C091245	1,957	0	0	0	0	1,957
				I-81 Viaduct Project DOT Contract 4	C093519	2,000	0	-2,060	0	0	-60
				Land-Commerce Substation	C091565	57	0	0	0	0	57
				LASELLE_PARK_RELOCATION	C086922	2,647	0	0	0	0	2,647
				Mobile Storage at Angola	C094583	167	5,970	333	333	0	6,803
				Mobile Storage at Chettenango	C094585	166	5,970	333	333	0	6,802
				Mobile Storage at Guilderland	C094584	166	6,150	334	334	0	6,984
				MOHAWK_VALLEY_EDGE_RELO_MARCY	C088115	234	0	0	0	0	234

				NorthSt_BethlehemRelocat_DelmarNY	C091217	1	1	0	0	0	2
				PIN#3501.60 I-81 Future Placeholder	C091451	0	0	0	7,380	7,380	14,760
				Pin#3501.60 I-81 Viaduct P1C2	C089924	83	-18	0	0	0	65
				PROCTORS_SCHENECTADY	C089381	85	0	0	0	0	85
				Reserve for Public Requirements Uni	C046922	0	2,000	2,000	3,000	3,000	10,000
				Shenctady County Multi Use Path	C088673	111	0	0	0	0	111
				Sky High Solar D-Stations	C087708	-9	0	0	0	0	-9
				St Lawrence County DOT CR 35/MorleR	C088961	35	0	0	0	0	35
				Watertown Vault 101 Alteration	C092584	138	0	0	0	0	138
			Public Requirements Total			**7,829**	**20,076**	**940**	**11,380**	**10,380**	**50,605**
		Customer Request/Public Requirement Total				**284,438**	**339,399**	**236,936**	**247,610**	**259,262**	**1,367,644**
				Cent NY-Dist-Damage/Failure Blankt	CNC0014	33,500	35,050	35,631	37,395	38,613	180,189
				Cent NY-Dist-Subs Blanket.	CNC0002	1,833	1,023	1,054	1,118	1,152	6,181
				East NY-Dist-Damage/Failure Blankt	CNE0014	29,500	31,405	31,421	32,834	33,835	158,994
				East NY-Dist-Subs Blanket.	CNE0002	1,833	709	730	775	798	4,845
			Blanket	Minor Storm NY-Central Blanket	C088053	4,000	4,120	4,244	4,371	4,503	21,239
				Minor Storm NY-East Blanket	C088049	4,000	4,223	4,349	4,480	4,614	21,666
				Minor Storm NY-West Blanket	C088056	4,000	4,841	4,986	5,136	5,290	24,252
				West NY-Dist-Damage/Failure Blankt	CNW0014	20,500	22,660	22,840	23,357	24,094	113,450
				West NY-Dist-Subs Blanket.	CNW0002	1,833	599	617	655	674	4,378
			Blanket Total			**100,999**	**104,630**	**105,872**	**110,121**	**113,573**	**535,194**
				07856 Phillips Road 4.8 kV Conversion	C092251	0	700	0	0	0	700
				Axa Equatible Towers Vault Rebuild	C093513	1,966	0	-2,000	0	0	-34
				Barclay Damon Vault Rebuild	C093526	831	0	-1,000	0	0	-169
				D-F- Barker Station- TB1	C087864	110	0	0	0	0	110
				DF -Commerce Ave Sta - Xfmr	C088755	725	0	0	0	0	725
				DF- Dorwin Sta 26 - SW217 SW216	C092654	175	0	0	0	0	175
				DF- Military Station 210 - R8915	C093249	113	0	0	0	0	113
				DF- Riverside Sta 288- TB4 Failed	C091468	1,274	2,605	0	0	0	3,879
				DF- Station 205- R205 failure	C090095	11	0	0	0	0	11
		Damage/Failure		DF- Station 40 - LTC Controllers	C093199	109	0	0	0	0	109
				DF- Watt St. Sta - Xfmr Failure	C090059	10	0	0	0	0	10
				DF-Station 205- TB3 Failure	C091523	1,455	0	0	0	0	1,455
				DF-Station 26- R914 R924 Cbl Tie Sw	C091232	145	0	0	0	0	145
				DF-Station 54- TB2 Replacement	C091518	1,401	934	0	0	0	2,335
			Damage Failure Other	Hague Rd 53 - Submarine Cable.	C050522	0	0	86	0	2,300	2,386
				Hotel Syracuse vault rebuilt	C093579	320	0	-450	0	0	-130
				Kennedy Plaza Vault rebuild	C093549	831	0	-1,000	0	0	-169
				NY Mobile 2E - Replacement	C086808	0	1,727	0	0	0	1,727
				One Financial Vault Rebuild	C093578	175	0	-300	0	0	-125
				Oneida Count bldg vault rebuild	C093582	320	0	-450	0	0	-130
				PAD 3321 Transformer Replacement	C084734	110	0	0	0	0	110
				Regency Park URD Cable Replacement	C087224	544	0	0	0	0	544
				Rensselaer Area Study: Greenbush	C091127	0	0	15	456	0	471
				Rensselaer Area Study: Reynolds Rd	C091146	888	0	0	0	0	888
				Rensselaer Area: New 07857 getaway	C091131	15	130	0	0	0	145
				Reserve for Damage/Failure Unidenti - Line	C046918	0	10,000	12,000	14,000	16,000	52,000
				Reserve for Damage/Failure Unidenti - Sub	C046948	2,000	6,000	6,000	7,000	7,000	28,000
				Roberta Rd Cable Replace Curry 53	C093053	65	0	0	0	0	65
				Utica_N0329_Relocation	C086500	587	0	0	0	0	587
			Damage Failure Other Total			**14,180**	**22,096**	**12,901**	**21,456**	**25,300**	**95,933**
		Damage/Failure Total				**115,179**	**126,725**	**118,773**	**131,577**	**138,873**	**631,127**
				Cent NY-Dist-Load Relief Blanket.	CNC0016	700	1,141	1,153	1,165	1,212	5,372
			Blanket	East NY-Dist-Load Relief Blanket.	CNE0016	785	1,556	1,593	1,669	1,736	7,339
				West NY-Dist-Load Relief Blanket.	CNW0016	218	558	564	578	601	2,519
			Blanket Total			**1,703**	**3,255**	**3,310**	**3,413**	**3,550**	**15,231**
				39253 Union Street Ratio Relief	C092343	0	0	107	0	0	107
				IE- NC Dist Transformer Upgrades	C014846	0	250	500	1,000	2,000	3,750
			Distribution Transformer Replacement	IE- NE Dist Transformer Upgrades	C015828	0	250	500	1,000	2,000	3,750
				IE- NW Dist Transformer Upgrades	C010967	0	250	500	1,000	2,000	3,750
				Lord'sHill 67 13.2kV padmount	C093934	700	0	0	0	0	700

				Lord'sHill 67 fdr 13.2kV conversion	C093933	1,000	0	0	0	0	1,000
			Distribution Transformer Replacement Total			**1,700**	**750**	**1,607**	**3,000**	**6,000**	**13,057**
				*Hague Rd 52 - Convert Route 22	C050717	0	0	0	0	2,500	2,500
				*Vail Mills 51 - County Hwy 107	C049793	400	0	0	0	0	400
				33452 NY-43 Conversion	C081968	611	0	0	0	0	611
				81452 Westminster Park Rd - Rebuild	C052344	1,270	0	0	0	0	1,270
				87554 County RTE 189 & 95 - Rebuild	C052367	728	0	0	0	0	728
				BakerSt 56 Delta Conversion Phase 1	C093874	0	0	800	1,910	1,230	3,940
				Bethlehem 02158 Conversion	C081882	15	236	0	0	0	251
				Brunswick 26453 - South Rd Conv	C045696	0	271	0	0	0	271
				Buffalo Station 98 - DLINE	C091780	0	0	36	50	100	186
				Buffalo Station 98 Sub	C091749	0	0	30	1,650	1,566	3,246
				Buffalo Station 99 - DLINE	C091781	0	0	0	36	50	86
				Buffalo Station 99 Sub	C091764	0	0	0	30	1,650	1,680
				Burgoyne 53 - Moss St. Conversion	C081410	95	0	0	0	0	95
				Butler 51 - Mountain Rd Conversion	C092242	0	0	210	0	0	210
				Cavanaugh 51 - River Road Recond.	C093986	92	0	0	0	0	92
				Charley Lake - pole mounted equip	C084684	0	145	0	0	0	145
				Cicero D-Line	C091779	50	184	5,794	5,959	5	11,993
				Cicero Substation	C091713	1,539	3,882	15,776	12,522	26	33,744
				Cleveland D-Line	C093655	0	0	437	1,682	6,701	8,820
				Clinton Sta - LN 12 15 THERM UPG	C088449	500	0	0	0	0	500
				Coffeen 56 Delta Conversion	C094206	0	0	0	0	240	240
				Commerce D Line	C091528	696	0	0	0	0	696
				Commerce Station	C091533	154	1,433	8,100	8,100	108	17,895
				Constantia D-Line Sub	C093653	0	0	206	788	3,138	4,132
				Cortland Area-study tie work	C091362	50	1,468	0	0	0	1,518
				Cortland LVAC_Disassemble	C087469	80	1,256	0	0	0	1,336
				Cortland Sta- LN1 3 18 THERM UPG	C088450	1,004	0	0	0	0	1,004
				Crown Pt 51 - Route 9N Conversion	C081834	15	344	0	0	0	359
				Curry 51 Carmen Rd Cable Repl	C093266	0	0	0	105	0	105
				Curry 51 E Lydius Reconductor	C093259	0	0	420	0	0	420
				Curry Rd 57 Fiero Ave Conversion	C089748	0	165	0	0	0	165
				Debalso Expansion - Sub	C091746	0	105	872	1,500	10,800	13,277
				DeLaet's Landing DxD	CD00893	0	0	6	0	0	6
				Delanson 51_3P Conv_E Esp. Braman	C087932	164	0	0	0	0	164
				Delanson 51_3P Conv_W Bramans Cor	C087924	207	0	0	0	0	207
				Delanson 52 - Ratio Relief	C090709	15	210	0	0	0	225
				Delanson TB1 40 MVA Rebuild	C092947	0	0	0	55	1,100	1,155
				Delmar Feeders Rebuild and Convert	C083926	43	1,440	2,332	2,723	1,363	7,900
				East Batavia 55 Delta Conversion	C093854	0	0	430	1,650	1,920	4,000
				East Batavia Substation - DLine Upg	CD00587	0	222	0	0	0	222
				East Golah 55 Delta Conversion	C093852	0	0	0	0	430	430
				East Pulaski Transformer Upgrade	C046634	0	0	110	4,650	0	4,760
				Elm Street Retirement	C082668	0	5	0	0	0	5
				Elmwood 23kV Cable Group	C091772	0	0	0	100	500	600
				Elnora 44256 - Diamond Rd 3phs Ext	C092841	0	15	405	0	0	420
				Elsmere - Feeder Getaways	C083920	17	474	718	19	0	1,228
				Elsmere Substation Rebuild	C083916	2,608	4,929	2,674	120	0	10,331
				EV RS - Angola -D-line	C094391	80	420	1,450	9,500	8,100	19,550
				EV RS - Angola -Sub	C094390	80	840	1,580	10,460	5,790	18,750
				EV RS - Chittenango-D-line	C094401	90	420	1,200	3,940	2,500	8,150
				EV RS - Chittenango-Sub	C094400	90	850	1,300	9,530	8,500	20,270
				EV RS - Dewitt-D-line	C094396	80	420	700	2,700	1,700	5,600
				EV RS - Dewitt-Sub	C094394	80	850	1,490	10,500	7,500	20,420
				EV RS - Pattersonville-D-line	C094392	90	420	1,200	3,840	2,800	8,350
				EV RS - Pattersonville-Sub	C094393	90	850	1,300	9,530	8,500	20,270
				EV RS - Pembroke (Flying J)-D-line	C094387	80	420	1,130	5,810	4,210	11,650
		System Capacity - NY		EV RS - Pembroke (Flying J)-Sub	C094380	80	850	1,710	9,700	8,670	21,010
				Extend F23251 to Relieve F20655	C081501	0	0	125	0	0	125
				Florida 52 - Route 30 Ratio Relief	C090613	0	0	0	350	0	350

				Load Relief	Front St 36051 - Glen Ave 13.2 Conv	C092682	0	15	475	0	0	490
					Gilbert Mills Xfmr Upgrade-Xfmr	C046563	76	542	520	3,909	1,961	7,008
					Hague Rd 52 Montcalm St Conversion	C087920	50	0	0	0	0	50
					Hague Rd 53 - Alexandria Ave	C081836	15	346	0	0	0	361
					Hancock 2 DLine upgrade	C093668	0	137	525	2,092	134	2,888
					Hudson 53 Getaway Replacement	C093240	0	0	0	14	84	98
					Install New UG Feeder 16071	C092685	10	500	0	0	0	510
					Lakeville Substation Retirement	C046588	237	245	0	0	0	482
					Lasher Rd 51 Cook Rd. Conversion	C089572	107	0	0	0	0	107
					Lasher Rd 51 Rte 147(Perth) Convers	C089013	0	9	447	0	0	456
					Liberty St D-Line Overhead Rebuild	C083844	50	158	2,000	2,078	1,615	5,901
					Lyndonville Tr Replace	C091756	0	0	35	350	1,050	1,435
					Malone 2nd Bank Feeders (D-Line)	C082332	171	4,200	4,315	3,520	440	12,646
					McClellan 51 Central Pkwy Convert	C089942	96	0	0	0	0	96
					MITS D-Line	C093714	0	0	0	150	579	729
					New Krumkill - Feeder Getaways	C083927	0	64	150	1,500	2,555	4,269
					New Krumkill - Retire 4.16 kV Equipment	C083911	215	0	0	0	0	215
					New Krumkill 52 Feed to Vista Tech Park	C083928	82	0	0	0	0	82
					New Krumkill Station	C091748	50	2,233	2,500	3,046	4,515	12,343
					New Krumkill/Ave A Line	C091773	0	270	1,073	1,500	2,585	5,428
					New Machias Station (Land Purchase)	C093642	0	0	2,000	0	0	2,000
					New Machias Substation (Station Wk)	C093639	0	0	0	105	1,397	1,502
					New Middleport 13.2kV	C091809	0	0	0	30	650	680
					New Royalton 13.2kV	C091747	0	0	30	650	2,566	3,246
					North Leroy 04 115kV THERMAL UPGR	C091521	709	10	0	0	0	719
					Ogden Brook 54 - Clendon Brook Rd	C092241	0	0	245	0	0	245
					Port Henry 51 - Convert Port Henry	C081529	0	545	0	0	0	545
					PS&I Activity - New York	C008153	400	772	1,024	1,013	1,199	4,408
					Reconfigure F20553 Add new SwGr	C092684	200	0	0	0	0	200
					Rome 55 Delta Conversion Phase 1	C094210	0	0	0	1,000	2,650	3,650
					Salisbury Station - D-line	C093800	0	683	2,625	3,052	0	6,360
					Salisbury Station - Sub Rebuild	C093794	0	105	1,397	504	11,637	13,643
					Sand Road 2 DLine upgrade	C093669	0	137	525	2,092	134	2,888
					Selkirk 14952 Overloaded ratio	C080204	189	0	0	0	0	189
					Seventh Ave North Feeder Conversion	C080476	17	1,024	880	0	0	1,921
					Seventh Ave South Feeder Conversion	C080475	16	601	490	0	0	1,107
					Seventh Ave. 13.2kV Transformer	C080474	0	250	2,454	332	0	3,036
					Sharon 51 - Route 20 Ratio Relief - 4.8kV Conversion	C090689	15	476	0	0	0	491
					Sharon 52 - Route 20 Ratio Relief	C090702	15	420	0	0	0	435
					Sodeman Rd 51 Feeder Construction	C076785	400	1,888	0	0	0	2,288
					Sodeman Rd 52 - Sodeman Road	C076794	0	448	0	0	0	448
					Sodeman Road 52 - Barney Rd. Rebuild	C047978	0	432	0	0	0	432
					South Eden Greenfield New Feeder 1	C048015	20	1,255	873	1	0	2,149
					South Eden Greenfield New Feeder 2	C048016	20	987	640	1	0	1,648
					South Eden Greenfield Substation	C046538	546	6,575	3,231	6	0	10,358
					South Newfane Tr Replace	C091763	0	0	0	35	350	385
					Station 3012 D-Line Part 2	C085610	2,753	0	0	0	0	2,753
					Station 3012 Substation	C074909	7,196	4,789	3,000	0	0	14,985
					Stoner Sta - LN 9 12 THERM UPG	C088455	233	0	0	0	0	233
					Summer Prep - Busti Load Relief	C092375	88	0	0	0	0	88
					Swaggertown 52 Beechwood Dr Conver	C088977	0	138	0	0	0	138
					Union Fall - Flood Mitigation -DSub	C078428	0	3,397	4,000	700	0	8,097
					Union St 52 - County Hwy 59	C056632	0	0	1,089	0	0	1,089
					Upgrade and Convert STA 74 SUB	C093600	0	105	1,397	504	1,246	3,252
					Vail Mills 51 - Cnty Hwy 107 Part 3	C090913	696	0	0	0	0	696
					Vail Mills 52 - Centerline Rd Ratio	C090717	95	0	0	0	0	95
					Valkin 53 Williams St Conversion	C089368	462	0	0	0	0	462
					W.Chautauqua Dline Work	C055265	0	0	50	1,500	0	1,550
					Warrensburg 52 - Glen Athol Road	C081457	15	174	0	0	0	189
					Watt Station Rebuild	C093729	0	0	0	0	122	122
					West Adams New Feeders TB2	C084110	17	1,725	2,300	0	0	4,042

				Whitehall 52 - Riverside Dr. Ratio Relief	C089635	0	776	0	0	0	776
			Load Relief Total			**26,455**	**59,553**	**92,830**	**149,192**	**129,165**	**457,196**
			Volt Var Optimization/ Conservation Voltage Reduction (VVO/CVR)	NY LTC Controller - D Sub	C085942	0	1,200	2,168	2,000	2,400	7,768
			Volt Var Optimization/Conservation Voltage Reduction (VVO/CVR) Total			**0**	**1,200**	**2,168**	**2,000**	**2,400**	**7,768**
		System Capacity - NY Total				**29,858**	**64,758**	**99,915**	**157,605**	**141,115**	**493,252**
			Asset Replacement	Bflo Sta 139 - Replace Transformers	C036639	8	0	0	1,726	1,131	2,866
				Birch Ave 52 - Big Hollow Rd Refurb	C086986	9,109	0	0	0	0	9,109
				Circuit Switcher Program	C093851	0	500	1,800	1,800	1,800	5,900
				Commerce/Partridge 13.2 kV Distribution	C092747	0	100	0	0	0	100
				Cortland Area-study Substation work	C090284	202	328	422	9,337	5,263	15,552
				CSP Transformer Program NYCD	C094159	0	100	100	100	100	400
				CSP Transformer Program NYED	C094158	0	100	100	100	100	400
				CSP Transformer Program NYWD	C094160	0	100	100	100	100	400
				Curry Road Sta - TRF #2 Replc	C088915	10	0	0	0	0	10
				DLINE trf for Woodard 24	C084776	0	65	0	0	0	65
				DLINE trf for Woodard-Ash 27/28	C084566	46	0	0	0	0	46
				Edwards Station	C091761	0	0	50	250	1,000	1,300
				Lasher Road - 53 Feeder OH	C068348	1,078	0	0	0	0	1,078
				LighthouseHill Relocation-Dist Line	C074342	607	212	23	0	0	841
				Line 301 DLine Underbuilt Transfer	C084600	6	60	0	0	0	66
				Line 811 D Line Transfer	C084585	50	21	162	0	0	233
				Little River D-Line	C088128	0	180	300	125	0	605
				Network Protector Replacement NYC	C091709	500	500	500	500	500	2,500
				Network Protector Replacement NYE	C091739	500	500	500	500	500	2,500
				Network Protector Replacement NYW	C091740	500	500	500	500	500	2,500
				Network Transformer Replacement NYC	C091680	500	500	500	500	500	2,500
				Network Transformer Replacement NYE	C091741	500	500	500	500	500	2,500
				Network Transformer Replacement NYW	C091742	500	500	500	500	500	2,500
				NY GE Butyl Rubber PT Replacement	C051745	41	0	0	0	0	41
				Padmount Switchgear Rpl Program NYC	C094099	10	400	400	400	400	1,610
				Padmount Switchgear Rpl Program NYE	C094098	10	400	400	400	400	1,610
				Padmount Switchgear Rpl Program NYW	C094100	10	400	400	400	400	1,610
				Patroon Feeder Getaways	C092740	0	0	0	213	2,000	2,213
				Raquette Lake Sub - Recloser & Regs	C080904	238	21	1	0	0	260
				Riverside 28855 Replacement Phase 1	C091889	387	0	0	0	0	387
				Schuylerville Retirement - Dist.	C084726	494	500	4,444	0	0	5,437
				Station 61 Distribution Relocation	C084919	47	574	1,031	1,908	10	3,569
				Sycaway 37256 Pawling Conversion	C082395	0	103	647	0	0	750
				Terminal Station Relocation_DLine	C059671	12	4,529	985	0	0	5,526
				UG for Pine Grove rebuild	C089334	0	300	405	0	0	705
				Union-Ausable #36 D-line transfers	C087252	0	37	167	0	0	204
			Asset Replacement Total			**15,364**	**12,030**	**14,936**	**19,859**	**15,704**	**77,894**
			Blanket	Cent NY-Dist-Asset Replace Blanket.	CNC0017	1,900	3,428	3,501	3,891	4,046	16,766
				East NY-Dist-Asset Replace Blanket.	CNE0017	1,200	2,339	2,379	2,725	2,834	11,477
				West NY-Dist-Asset Replace Blanket.	CNW0017	3,000	5,517	5,387	5,853	6,087	25,844
			Blanket Total			**6,100**	**11,284**	**11,268**	**12,468**	**12,967**	**54,087**
			Buffalo St Light Cable Repl	Buffalo Street Lt Cable Replacement	CD00851	2,000	3,000	3,500	4,000	4,000	16,500
			Buffalo St Light Cable Repl Total			**2,000**	**3,000**	**3,500**	**4,000**	**4,000**	**16,500**
			Conductor Clearance	Station 79 D-Line Relocation	C084921	850	1,481	2,049	550	0	4,930
			Conductor Clearance Total			**850**	**1,481**	**2,049**	**550**	**0**	**4,930**
			Dist. Overhead Line (Program)	Gard-Dun 141-142 D Line Relocation	C079005	1,196	24	0	0	0	1,220
				Maple Ave. - Convert 32422 & 32423	C069912	26	0	0	0	0	26
				Transf Dist Fdrs-Phillips-Tel-L304	C084842	15	464	0	0	0	480
				Yahnundasis Rebuild D-line	C093627	0	0	0	485	485	970
			Dist. Overhead Line (Program) Total			**1,237**	**488**	**0**	**485**	**485**	**2,695**
			Inspection & Maintenance	I&M - NC D-Line OH Work From Insp.	C026160	11,760	9,706	10,095	10,498	10,918	52,977
				I&M - NC D-Line UG Work From Insp.	C026163	628	629	700	1,000	1,000	3,957
				I&M - NE D-Line OH Work From Insp.	C026159	8,680	9,706	10,095	10,498	10,918	49,897
				I&M - NE D-Line UG Work From Insp.	C026162	500	500	500	750	750	3,000
				I&M - NW D-Line OH Work From Insp.	C026161	7,560	9,706	10,095	10,498	10,918	48,777

				I&M - NW D-Line UG Work From Insp.	C026164	1,000	1,000	1,000	1,500	1,500	6,001
				Inspection & Maintenance Total		**30,128**	**31,248**	**32,484**	**34,745**	**36,005**	**164,610**
			Load Relief	Demo Delmar Station	C088901	0	10	44	66	0	120
				Load Relief Total		**0**	**10**	**44**	**66**	**0**	**120**
			Ntwk Secondary UG Cable Repl	Cable Replacement - Ntwk Sec NYC	C091744	0	0	0	1,500	5,000	6,500
				Cable Replacement - Ntwk Sec NYE	C078270	2,000	3,000	4,000	4,500	5,000	18,500
				Cable Replacement - Ntwk Sec NYW	C077338	1,500	3,000	4,000	4,500	5,000	18,000
				Ntwk Secondary UG Cable Repl Total		**3,500**	**6,000**	**8,000**	**10,500**	**15,000**	**43,000**
			Primary UG Cable Replacement	MV Island XFMR repl. - Central Div	C026977	0	320	400	2,000	0	2,720
				MV-Camp KillKare/Lake Kora-Cable	C088822	1,683	0	0	0	0	1,683
				URD/UCD Cable Replacement NYCD	C094137	10	1,500	1,500	2,000	2,000	7,010
				URD/UCD Cable Replacement NYED	C094116	10	2,500	2,500	3,500	3,500	12,010
				URD/UCD Cable Replacement NYWD	C094139	10	800	800	1,500	1,500	4,610
				Primary UG Cable Replacement Total		**1,713**	**5,120**	**5,200**	**9,000**	**7,000**	**28,033**
			Sta Metal-Clad Switchgear	Blue Stores - Replace IMCS	C081611	726	2,908	4,024	845	12	8,515
				Little River Station - Sta Rebuild	C085010	84	762	763	4,289	4,265	10,163
				Market Hill substation retirement	C046367	26	0	0	0	0	26
				McKownville 327 Metalclad Replacem	C056612	175	0	392	0	0	567
				Metal Clad Replacement Program	C084936	0	2,500	5,000	5,000	5,000	17,500
				Pine Grove Metalclad Replacement	C056614	500	1,582	6,656	5,133	0	13,872
				Pinebush - Replace Metalclad Gear	C046744	175	490	1,995	840	0	3,500
				Prospect Hill - Replace Metalclad	C080223	430	0	0	0	0	430
				Rock Cut Metalclad	C083445	0	175	490	2,826	0	3,491
				Saratoga Substation Retirement	C083487	0	0	41	100	50	191
				Station 162 Metalclad Replacement	C052706	4,662	808	0	0	0	5,471
				Station 61 - Metalclad Replacement	C051707	549	985	2,110	3,948	10,165	17,757
				Sycaway - Metalclad Replacement	C081630	321	640	3,212	1,835	0	6,008
				Tuller Hill 246 Unit Metalclad Repl	C056611	1,000	1,155	3,757	0	0	5,912
				Sta Metal-Clad Switchgear Total		**8,649**	**12,004**	**28,441**	**24,817**	**19,491**	**93,402**
			Substation Battery & Related	Batts/Charg- NY Central	C032013	300	300	300	300	300	1,500
				Batts/Charg- NY West	C032014	300	300	300	300	300	1,500
				Batts/Charg--NY East	C032012	300	300	300	300	300	1,500
				Substation Battery&Related Total		**900**	**900**	**900**	**900**	**900**	**4,500**
			Substation Breaker	Baker Street Station 150 - ARP	C094670	0	235	428	0	0	663
				Belmont Station 260 - ARP	C094486	0	370	865	0	0	1,235
				Brasher Station 851 - ARP	C094669	0	400	790	0	0	1,190
				Cobleskill Station 214 - ARP	C094512	0	136	405	0	0	541
				Colvin Station 313- OCB R4 Rpl	C094291	118	276	0	0	0	394
				East Pulaski Station 324 - ARP	C094493	0	107	249	0	0	356
				Emmet St Station - ARP	C094474	412	671	0	0	0	1,083
				NC ARP Breakers & Reclosers	C032253	927	0	0	1,600	1,600	4,127
				NE ARP Breakers & Reclosers	C032252	680	0	0	1,600	1,600	3,880
				NW ARP Breakers & Reclosers	C032261	649	0	0	1,600	1,600	3,849
				Proactive Breaker Program(Dist)	C093866	0	3,750	750	300	1,000	5,800
				Seventh Ave Station 244 - ARP	C094511	0	220	450	0	0	670
				Station 54 - ARP	C094290	553	1,290	0	0	0	1,843
				Walesville Station 331 - ARP	C094513	0	320	594	0	0	914
				Substation Breaker Total		**3,339**	**7,774**	**4,530**	**5,100**	**5,800**	**26,544**
			Substation Indoor	Beech St 81 - Indoor Substation Ref	C046577	0	55	126	3,723	3,001	6,905
				Substation Roof Program (NYWD)	C093850	0	2,000	2,000	2,000	2,000	8,000
				Tuller Hill Control house	C088612	22	900	0	0	0	922
				Substation Indoor Total		**22**	**2,955**	**2,126**	**5,723**	**5,001**	**15,827**
			Substation Mobile	Mobile 4C -Mobile Sub Replacement	C089181	650	1,300	0	0	0	1,950
				Mobile 9C -Mobile Sub Replacement	C089184	0	650	1,300	0	0	1,950
				NY Mobile Substation Program	C051744	0	1,500	1,500	3,000	3,000	9,000
				Substation Mobile Total		**650**	**3,450**	**2,800**	**3,000**	**3,000**	**12,900**
			Substation Power Transformer	Altamont TB2 Replacement	C086700	0	0	0	100	3,900	4,000
				Buff Sta 207-Temp Bk for T-Line WO	C086559	133	0	0	0	0	133
				IE - NY ARP Transformers	C025801	0	900	900	1,800	1,800	5,400
				Lewiston Heights 086 Rpl TB1	C083225	0	50	250	1,500	750	2,550
				NY ARP Spare Substation Transformer	C026055	0	2,212	4,112	9,014	11,514	26,852

				Proactive Transformer Program	C093863	0	5,000	5,000	5,000	5,000	20,000
				Stittville Station	C091745	0	105	872	504	798	2,279
			Substation Power Transformer Total			**133**	**8,267**	**11,134**	**17,918**	**23,762**	**61,214**
			Substation Relay	NYC Dist Sub Obsolete Relay Prog	C093893	116	516	534	550	567	2,283
				NYE Dist Sub Obsolete Relay Program	C093822	116	516	534	550	567	2,283
				NYW Dist Sub Obsolete Relay Program	C093894	116	516	534	550	567	2,283
				Riverside - Relay Rplc	C085851	599	143	0	0	0	741
				Shawnee Station 76 Relay Relabeling	C088556	32	0	0	0	0	32
				South Eden Substation IMCS	C086809	1,151	768	0	0	0	1,919
			Substation Relay Total			**2,130**	**2,459**	**1,602**	**1,649**	**1,700**	**9,540**
			Substation Voltage Regulator	Station Regulator Rpl Program	C094117	0	1,050	1,050	1,400	1,400	4,900
			Substation Voltage Regulator Total			**0**	**1,050**	**1,050**	**1,400**	**1,400**	**4,900**
			Substation Transformer Replacement	Trinity TB4 and TB6 XFMRs and Bus	C086717	1,857	8,478	7,986	5,884	50	24,255
			Substation Transformer Replacement Total			**1,857**	**8,478**	**7,986**	**5,884**	**50**	**24,255**
			Substation Breaker Replacement	Trinity 115kV OZB Brkr rpl	C085825	0	42	1,353	0	0	1,395
			Substation Breaker Replacement Total			**0**	**42**	**1,353**	**0**	**0**	**1,395**
		Asset Condition Total				**78,572**	**118,040**	**139,403**	**158,065**	**152,266**	**646,346**
			MVD Hosting Capacity	Emmet Street 08 and 09 Conversion	C092270	0	15	505	0	0	520
				Inman 58 Cornelious Ave Conversion	C089653	15	153	0	0	0	168
				Lasher Road Feeder #52 Conversions	C086787	1,798	0	0	0	0	1,798
				Lynn St 57 Guilderland Ave Convert	C089679	15	127	0	0	0	142
				New Krumkill 42127 & 26 conversions	C083929	25	462	0	0	0	487
				Rosa Rd 13756 West Ally Conversion	C089605	0	0	201	0	0	201
				Wolf Road Getaway Replacement	C093700	0	0	0	137	525	662
			MVD Hosting Capacity Total			**1,852**	**757**	**706**	**137**	**525**	**3,977**
				*NR-81452-Jolly Island Grp-Upgrade	C049780	0	0	27	750	0	777
				3rd Ave Ext Greenfield: Substation	C093658	0	0	0	0	110	110
				Alder Creek Substation Rebuild	C093792	0	250	1,876	5,764	2,197	10,087
				Avenue A Station Rebuild	C056609	0	0	1,500	1,500	1,500	4,500
				Bethlehem 55	C094339	0	0	0	172	662	834
				Bloomingdale/Gabriels D-Line	C093906	0	0	0	184	735	919
				Bloomingdale/Gabriels Rebuild	C093900	0	0	0	191	766	957
				Bolton Station Rebuild	C093761	0	0	0	0	105	105
				Boyntonville Rebuild: Substation	C093660	0	0	0	0	122	122
				Brunswick Rebuild	C093662	0	0	0	0	122	122
				Buckley Corners D-Line	C093772	0	0	50	50	50	150
				Buckley Corners Station Rebuild	C093768	0	0	50	50	50	150
				Buffalo Station 122 Rebuild - Line.	CD00779	1,043	0	0	0	0	1,043
				Buffalo Station 122 Rebuild - Sub	CD00782	395	0	0	0	0	395
				Buffalo Station 25 Rebuild - Line	C036458	0	0	0	50	50	100
				Buffalo Station 25 Rebuild - Sta	C036456	80	1,300	480	570	600	3,030
				Buffalo Station 30 - Rebuild - Fdrs	C015754	0	50	50	1,700	600	2,400
				Buffalo Station 30 Rebuild - Sta	C046519	10	2,164	1,814	4,370	3,834	12,192
				Buffalo Station 31 Rebuild - Line	C046943	853	1,277	229	21	0	2,379
				Buffalo Station 31 Rebuild - Sub	C046952	1,945	7,009	6,480	2,000	0	17,434
				Buffalo Station 32 Rebuild - Line	C036461	248	121	0	0	0	369
				Buffalo Station 32 Rebuild - Sta	C036459	3,914	1,843	0	0	0	5,757
				Buffalo Station 34 Rebuild - Line	C046932	0	0	0	0	50	50
				Buffalo Station 34 Rebuild - Sub	C046953	0	51	250	10	2,164	2,475
				Buffalo Station 35 Rebuild - Line	C046934	0	0	0	50	50	100
				Buffalo Station 35 Rebuild - Sub	C046954	80	1,300	480	570	600	3,030
				Buffalo Station 38 Rebuild - Line	C046936	1,902	330	132	0	0	2,364
				Buffalo Station 38 Rebuild - Sub	C046955	4,257	2,270	6	0	0	6,533
				Buffalo Station 41 Rebuild - Line	C046938	0	0	0	0	50	50
				Buffalo Station 41 Rebuild - Sub	C046956	0	51	250	10	2,164	2,475
				Buffalo Station 45 Rebuild -Line	C090726	0	0	86	1,750	600	2,436
				Buffalo Station 45 Rebuild -Sub	C090725	10	1,650	1,566	1,669	4,927	9,822
				Buffalo Station 51 Rebuild - Line	C046927	0	0	86	1,750	600	2,436
				Buffalo Station 51 Rebuild - Sub	C046958	10	1,650	1,566	1,740	4,927	9,893
				Buffalo Station 53 Rebuild - Line	C046929	36	0	0	0	0	36
				Buffalo Station 53 Rebuild - Sub	C046945	655	0	0	0	0	655

Local	Local Rates	Multi-Value Distribution (MVD)	MVD System Capacity	Buffalo Station 68 Rebuild - Line	C046931	0	0	0	0	50	50
				Buffalo Station 68 Rebuild - Sub	C046946	0	0	51	250	2,174	2,475
				Burdeck Station Rebuild	C093727	0	0	0	111	1,466	1,577
				Burgoyne Station Rebuild	C093722	0	0	0	0	110	110
				Butler Transformer Upgrade 40MVA	C093721	0	0	0	0	110	110
				Cedar Station Rebuild	C093723	0	0	0	0	122	122
				Central Utica Boutique Sub - D-Line	C093808	0	137	525	2,092	134	2,888
				Chadwicks Expansion - D-line	C093804	0	0	0	10	3,800	3,810
				Chadwicks Expansion - Sub	C093803	0	105	872	504	798	2,279
				Cobleskill Area Study D-Line	C091671	0	480	2,000	2,000	0	4,480
				Cobleskill Connect Transformer TB2	C086902	0	1,300	0	0	0	1,300
				Corinth Rebuild	C093749	0	0	0	0	122	122
				CORLISS PARK XFMR 2 & BUS INSTALL	C081991	1,500	1,841	1,130	0	0	4,471
				Cortland Area-study d-line work	C090298	57	98	119	1,489	1,148	2,911
				County Hwy 138 OL Ratio Broadalbin	C092061	10	134	0	0	0	144
				Curtis Greenfield: Substation	C093750	0	0	0	0	105	105
				Debalso Expansion - D-Line	C093802	0	0	0	10	3,800	3,810
				Delaware D-Line	C091776	0	0	35	1,000	1,000	2,035
				Dorwin D-lines	C093699	0	410	1,575	6,277	401	8,663
				Dorwin Station - Station Rebuild	C091197	0	2	0	208	0	210
				E. Fulton Station Retirement D-Line	C093649	0	0	0	50	1,609	1,659
				Eagle Bay Pad D-line	C093628	0	0	0	0	158	158
				East Schodack Station Rebuild	C093712	0	0	0	0	122	122
				Eighth St 80 - Indoor Substation Re	C046585	1,957	8,543	4,846	1,513	0	16,859
				Eighth St 80 - Sub Refurb D-Line.	C046586	464	1,267	62	0	0	1,793
				Eleventh St 82 - Indoor Substation	C046582	0	20	126	3,723	3,001	6,870
				Elnora Station Rebuild	C093680	0	0	0	0	104	104
				Everett Station Rebuild	C093704	0	0	0	0	110	110
				F16066 Rbld/Reloc Riser Summer St	C092367	294	0	0	0	0	294
				Fayette St Line	C081980	335	347	521	326	9	1,538
				Fayette St Substation	C081981	894	2,487	8,071	5,281	2,858	19,590
				Franklinville Station 24 - New Sub	C093544	0	0	0	105	1,397	1,502
				French Mountain Transformer Replace	C061706	10	238	0	0	0	248
				Galeville 71 72&73 fdrs conversion	C050749	126	1,127	0	0	0	1,253
				Galeville Station Rebuild	C050746	271	2,995	6,348	1,039	0	10,654
				Gilmantown Station Rebuild	C093787	0	0	0	137	525	662
				Gloversville D-Line	C091775	0	0	0	0	35	35
				Gloversville Station Rebuild	C093731	0	0	0	0	105	105
				Granby Center Expansion	C093650	0	0	0	128	1,059	1,187
				Grand Island Station Build	C081485	33	1,200	622	3,589	1,977	7,422
				Grand St Rebuild	C093693	0	0	0	0	116	116
				Karner 4.16 kV Feeder Conversions	C049958	50	50	0	2,935	1,226	4,261
				Knapp Road Station	C093760	0	0	0	105	1,397	1,502
				Lake George Station	C093767	0	0	0	0	105	105
				Liberty St TB5 Install 34.5/13.8kV	C081420	768	1,770	2,502	2,730	0	7,770
				Manheim Distribution	C074489	31	3,638	257	1,332	0	5,258
				Mayfield Station Rebuild	C093733	0	0	0	0	105	105
				McClellan Station Rebuild	C093728	0	0	0	0	122	122
				McCrea Station Retirement	C046790	0	0	36	0	0	36
				Mexico Dline	C093643	0	1,324	3,093	4,004	3,915	12,336
				Middleburg Rebuild	C093689	0	0	0	0	100	100
				Mill St Station Rebuild	C084102	50	488	1,442	4,000	2,058	8,038
				Minoa Sub	C093705	0	0	0	66	738	804
				MV-Clinton TB1 Replacement HC	C086880	0	500	2,439	82	0	3,021
				Nassau Station Rebuild	C093706	0	0	0	0	110	110
				New Franklinville Station - LAND	C093616	0	0	0	2,000	0	2,000
				Newfane 170 Asset Condition	C091765	0	0	0	30	1,650	1,680
				Newtonville Area Study: D-Line	C091022	250	2,000	2,000	2,000	2,000	8,250
				Newtonville Area Study: Johnson	C091023	435	50	50	2,775	4,850	8,160
				Newtonville Area Study: Newtonville	C091025	5	5	5	5	5	25
				Newtonville Area Study: Oathout	C091026	1	1	1	1	1	3

				Northville Station Rebuild	C093735	0	0	0	0	110	110
				Ohio St - Buffalo River Tunnel/Bore	C050400	2,500	0	0	0	0	2,500
				Otten 3 Phase Extension	C093754	0	0	0	0	683	683
				Partridge Station Rebuild	C093708	0	0	0	0	110	110
				Phillips-Barker D-Line Transfer	C084449	15	33	0	0	0	48
				Pinebush Station Rebuild	C093709	0	0	0	0	110	110
				Port Henry Rebuild	C093742	0	0	0	0	105	105
				Raquette Lake Transformer Upgrade	CD01139	4	173	0	0	0	177
				Rebuild Ash 4160	C082032	309	583	1,320	151	6	2,370
				Riverside 12/16/20MVA Spare	C090279	768	0	0	0	0	768
				Riverside 28855 UG Cable Replaceme.	C036468	0	100	900	800	1,700	3,500
				Roberts Rd Sta-Replace TB1	C086985	0	50	250	1,500	750	2,550
				Ruth Road Rebuild Distribution Work	C052304	50	0	4,125	2,733	1,196	8,104
				Ruth Road Station Rebuild	C081613	4,282	4,281	9,514	1,925	8	20,010
				Sand Creek 54 - Breaker Install	C087927	486	6	0	0	0	492
				Sand Creek 54 Distribution	C052306	2,812	721	0	0	0	3,533
				Schenevus 26127 13.2 kV Rebuild	C093667	0	50	400	400	200	1,050
				Schenevus Rebuild	C093665	0	0	0	0	84	84
				Schodack Station Rebuild	C093710	0	0	0	0	110	110
				Schroon 51 US-9 Mainline Relocation	C093776	7	604	0	0	0	611
				Schroon Lake Station Rebuild	C093740	0	0	0	0	105	105
				Scofield Station Rebuild	C093777	0	0	0	0	105	105
				Smith Bridge - New TB2 Getaways	C083483	52	106	2,465	13	0	2,636
				Smith Bridge 2nd Bank & Metalclad	C081418	57	2,455	4,711	500	0	7,723
				Smith Bridge 56 & 57 -Build Feeders	C083485	49	225	538	2,848	200	3,860
				Sonora Way - New Feeders	C046552	1,765	0	0	0	0	1,765
				Sonora Way Station - New SWG	C060141	7,317	0	0	0	0	7,317
				South Street Rebuild	C093745	0	0	0	0	105	105
				Station 140- D-Line Work	C093018	0	80	200	830	0	1,110
				Station 140 Station Rebuild	C056616	870	3,320	9,988	4,580	2,320	21,078
				Station 162 D-Line	C085662	341	54	0	0	0	394
				Station 79 Rebuild	C082713	800	7,535	5,979	4,492	0	18,805
				Stittville Station D-line	C093785	0	650	2,500	3,763	0	6,913
				Summit Rebuild	C093692	0	0	0	0	95	95
				Swagertown Station Upgrades	C091754	740	480	550	4,703	4,443	10,916
				Swaggertown 54 and Scotia Conversion	C091774	240	657	788	2,000	2,000	5,685
				Sycaway D-Line Getaway	C092376	30	30	100	0	0	160
				Syr_HCB UCD Rework	C083237	548	110	0	0	0	657
				Syr-Genant Dr MH 3 to 4 Duct Line	C088114	572	0	0	0	0	572
				Syr-State St-Cables	C083235	2,090	0	0	0	0	2,090
				Temple Distribution Rebuild	C079534	4,119	5,408	0	0	0	9,527
				Third St. Retirement D-Line	C093651	0	0	0	50	2,604	2,654
				Tuller Hill DLine-13kV Getaway	C064446	158	15	0	0	0	173
				UG for Temple Rebuild	C079532	2,012	582	0	0	0	2,594
				Unionville D-Line Work	C093713	0	0	0	137	525	662
				Upgrade and Convert STA 74 D-Line	C093601	0	0	0	0	632	632
				Vail Mills Station Rebuild	C093736	0	0	0	0	110	110
				Valkin Station Rebuild	C093762	0	0	0	0	105	105
				VM52 Honeywell Corners Rd OL Ratio	C092056	0	80	0	0	0	80
				Voorheesville Station Rebuild	C093711	0	0	0	0	110	110
				Warrensburg Rebuild	C093763	0	0	0	0	110	110
				Waterport Asset Condition	C091751	0	0	30	1,650	1,566	3,246
				Weaver Station Rebuild	C093730	0	0	0	0	122	122
				Welch 83 - Sub Refurb D-Line	C046584	4,918	150	0	0	0	5,068
				Welch 83 Indoor Substation Refurbis	C046583	1,832	26	0	0	0	1,857
				Wells Station Rebuild	C093732	0	0	0	0	105	105
				West Adams 2nd Bank	C084111	160	1,510	680	5,590	0	7,940
				Whitaker station expansion	C093648	0	0	0	128	1,059	1,187
				White Lake Pad D-Line	C093608	0	0	0	0	158	158
			MVD System Capacity Total			**62,879**	**83,945**	**100,743**	**115,621**	**96,295**	**459,481**
		Multi-Value Distribution (MVD) Total				**64,731**	**84,701**	**101,449**	**115,757**	**96,820**	**463,458**

Blanket	Cent NY-Dist-Reliability Blanket.	CNC0015	1,800	3,358	3,428	3,816	3,968	16,370
	East NY-Dist-Reliability Blanket.	CNE0015	3,000	5,017	5,137	5,593	5,816	24,562
	West NY-Dist-Reliability Blanket.	CNW0015	3,100	4,913	5,031	5,482	5,701	24,228
Blanket Total			**7,900**	**13,288**	**13,596**	**14,890**	**15,486**	**65,160**
ERR_Eng Reliability Review	*Grooms Rd 34556 - Rte 146 Reconduc	C050105	0	0	0	0	8	8
	*Union St 54-Lincoln Hill Rd Ph 2	C056627	0	0	10	900	0	910
	Center St 52 - Hickory Hill Rd Conv	C056808	0	242	0	0	0	242
	Chrisler Ave 25735 Conversion	C057133	50	1,405	0	0	0	1,455
	Chrisler Ave 25737 Conversion	C057132	127	0	0	0	0	127
	Vail Mills 52 - County Hwy 16 Convt	C055530	10	137	0	0	0	147
ERR_Eng Reliability Review Total			**187**	**1,784**	**10**	**900**	**8**	**2,889**
Flicker	Mumford Sta- 115kV Cap Bank	C092217	1,060	0	0	0	0	1,060
Flicker Total			**1,060**	**0**	**0**	**0**	**0**	**1,060**
	*Byron F1863 - Rebuild /Reconductor	C049762	0	0	0	1,250	1,250	2,500
	01251 Church Ave. Conversion	C092818	0	20	203	0	0	223
	08751 State HWY 23 Conversion	C090923	225	0	0	0	0	225
	08752 Hudson Avenue Conversion	C090554	108	0	0	0	0	108
	08753 County HWY 10 Conversion	C091063	243	0	0	0	0	243
	08753 Michael Court Conversion	C090305	215	0	0	0	0	215
	08754 Glenwood Boulevard Conversion	C091897	0	15	785	0	0	800
	09491 1st St. Alley Conversion	C091218	15	132	0	0	0	147
	12351 Fogarty Rd. Conversion	C090868	13	525	0	0	0	537
	12351 Valley Falls Rd. Conversion	C091071	10	445	0	0	0	455
	12353 Gypsy Ln. Extension	C091091	78	0	0	0	0	78
	12353 Middleburgh St. Conversion	C092618	20	616	0	0	0	636
	14251 City Hall Line Relocation	C088182	927	0	0	0	0	927
	26452 Averill Park Rd. Conversion	C092769	0	20	432	0	0	452
	26452 White Church Rd. Conversion	C092770	0	20	522	0	0	542
	26453 Moonlawn Rd. Conversion	C091067	368	0	0	0	0	368
	26453 Tamarac Rd. Conversion	C092718	0	7	336	0	0	343
	26453 White Church Rd. Conversion	C090459	10	207	0	0	0	217
	27652 Orchard St 4.8 kV Conversion	C091116	0	10	340	0	0	350
	28551 Miner Rd. Conversion	C092827	0	0	20	702	0	722
	30351 County HWY 19 Conversion	C091345	0	14	476	0	0	490
	30353 Bells Pond Road Conversion	C090627	0	647	115	0	0	762
	30353 CTY RTE 27 3-Phase Extension	C091807	0	15	285	0	0	300
	30353 US HWY 9 Back Lot Relocation	C091819	0	15	210	0	0	225
	30353 Water Street Rear Lot	C093015	0	14	56	0	0	70
	31451 Eddy Rd. Conversion	C090039	116	0	0	0	0	116
	32851 Farm to Market Rd. Extension	C091069	0	287	0	0	0	287
	32951 NY-50 Conversion	C089187	10	515	0	0	0	525
	33457 Thompson St. Ratio Relief	C091214	132	0	0	0	0	132
	34257 Irwin Rd. Relocation	C090810	145	0	0	0	0	145
	36654 Wheelock Street Conversion	C090245	0	73	0	0	0	73
	36955 S Greenfield Rd. Conversion	C092821	0	20	297	0	0	317
	37653 Mc Millan Rd. Conversion	C090094	113	0	0	0	0	113
	42753 County Road 21 Conversion	C091595	0	15	565	0	0	580
	Ashley 51 - Cedar 51 Tie	C092239	0	0	560	0	0	560
	Bagdad-Dake Hill refurb Dline Xfer	C087243	0	0	31	0	0	31
	Baker St - Install 2nd xfmr	C046553	0	0	0	150	1,800	1,950
	Bartell 54 Delta Conversion	C094191	0	0	0	0	260	260
	Bartell 55 Delta Conversion	C094187	0	0	0	260	990	1,250
	Black Lake Rd (Sout) Rebuild	C081835	233	0	0	0	0	233
	Blue Stores 52 Rear Lot Relocation	C081571	0	474	0	0	0	474
	Buffalo Indoor Station Louvres West	C092411	129	0	0	0	0	129
	Burgoyne 52 - Eldridge Rd Rebuild	C091948	152	0	0	0	0	152
	Camillus Dsub	C046637	13	0	0	0	0	13
	Caughdenoy Rd tie	C082301	0	50	569	0	0	619
	Cell Tower Line Rd Relocation 84661	C078048	0	379	0	0	0	379
	Chestertown 51 - Rebuild Cnty Hwy 8	C081454	207	0	0	0	0	207
	Chestertown 52 - Hayesburg Road	C081460	15	0	174	0	0	189

		Reliability	Reliability	Chestertown 52 - Rebuild US Hwy 9	C081455	263	0	0	0	0	263
				Chippewa Bay Rebuild	C077857	64	0	0	0	0	64
				CLCPA Clinton 54 to Temp Sub Marshville 51	C091832	1,531	0	0	0	0	1,531
				CLCPA Marshville Temporary Sub	C091833	1,267	0	0	0	0	1,267
				CLCPA Salisbury 53-St Johnsville 51	C093981	693	0	0	0	0	693
				CLCPA St Johnsville 51-Salisbury 53	C091830	2,896	1,372	0	0	0	4,268
				CLCPA St Johnsville 54 - Inghams 51	C091831	3,383	1,824	0	0	0	5,207
				Cleveland-Lehigh Part 1	C081845	312	0	0	0	0	312
				Cleveland-Lehigh Tie Part 2	C081847	339	0	0	0	0	339
				Convert F3462 & 3465 to Underground	C093555	0	0	500	3,150	3,150	6,800
				Convert Louisiana St from OH to UG	C093590	0	500	4,300	1,500	0	6,300
				Cook Road Rebuild Hammond	C077858	125	0	0	0	0	125
				Corliss Park East OH Work	C081415	79	500	0	0	0	579
				Corliss Park South Feeder Conversio	C081414	50	990	1,851	988	490	4,369
				Corliss Park West Feeder Conversion	C081385	24	0	0	0	0	24
				Crown Pt. 51 - Creek Rd Conversion	C081827	124	0	0	0	0	124
				Crystal Lake Rebuild 87651	C092989	99	0	0	0	0	99
				Curry Rd. 53 Fort Hunter Rd Rebuild	C088645	260	0	0	0	0	260
				Delameter - 115kV circuit switchers	C051492	26	30	79	500	10	645
				Delameter Substation Rebuild	C046536	450	1,500	4,876	6,749	1,061	14,636
				Delaware 33033 Conversion	C090527	10	382	0	0	0	392
				Elnora 55 - Feeder Getaway	C086975	444	0	0	0	0	444
				Elnora 57 6IVS recloser and fusing	C090064	114	0	0	0	0	114
				Emmet St Station - Dx Retirement	C080418	0	281	55	0	0	337
				Fayette Rd Conversion #2 85251	C081826	15	546	0	0	0	561
				Fayette Rd Conversion 85251	C081825	10	480	0	0	0	490
				FY20 D5D Porcelain Replacement NYE	C082234	250	249	249	249	249	1,246
				FY22 D5D Porcelain Replacement NYC	C082233	250	273	273	273	273	1,342
				FY22 D5D Porcelain Replacement NYW	C082232	250	273	273	273	273	1,342
				G&W Viper Replacement Program (West	C081839	50	50	50	50	52	251
				G&W Viper Replacement Program-NY	C080931	50	50	50	50	52	251
				Gensee St. Feeder Conversions	C051873	24	0	0	0	0	24
				Hinsdale Dsub Retirement	C046638	0	0	0	13	0	13
				Hoosick 31451 Carey Ave Tie	C084000	21	0	0	0	0	21
				Indian River - Install 115kV Brkr	C089578	0	940	900	0	0	1,840
				Inman 58- Eastern Pkwy Conversion	C088738	605	0	0	0	0	605
				Juniper Station Retirement	C092486	0	0	10	53	0	63
				Liberty St 13.2kV Getaways	C081421	0	0	91	0	0	91
				Little River 54 Tie Part 2	C089361	486	0	0	0	0	486
				Lockport Road 216 - Install TB#2 -	CD01252	0	0	10	300	0	310
				Long Rd 209 - New F20955	CD00964	0	0	1,383	0	0	1,383
				Long Road 209 - Install TB2	CD00977	56	1,300	3,194	1,668	0	6,217
				McIntyre-Hammond #24 Dist. Taps	C083853	33	1,185	782	0	0	1,999
				Menands 10158 4.8kV Conversion	C092865	0	20	367	0	0	387
				Mill St_LVAC_2014 Upgrades-N-2	C053903	0	600	600	0	0	1,200
				Mill ST_LVAC_2014 Upgrades-Newell	C054438	0	398	0	0	0	398
				Minor Storm Hardening - 32451	C056486	259	0	0	0	0	259
				Mohican Distribution	C081399	2,314	1,872	0	0	0	4,186
				Mount Arab Lake Submarine Cable	C087232	222	738	0	0	0	960
				MSH- Barker F7863 - Bring to the Rd	C082086	394	0	0	0	0	394
				Mumford #50 - TB2 - Install New Fdr	C046589	0	0	115	828	0	943
				Mumford #50 -Install Transformer #2	C046590	0	150	1,800	3,240	2,032	7,222
				New Krumkill 42154	C091181	234	5,515	0	0	0	5,749
				North Bangor new 34.5/13.2kV Statio	C046423	0	0	7	0	0	7
				NY - East_1 ph cutout mounted Rclrs	C053928	123	123	126	126	126	623
				NY_Central_1ph_Cutout_Mnt_Reclosers	C059620	121	121	126	126	126	619
				NY_West_1 PH Cutout Mnted Reclosers	C059607	121	122	126	126	126	621
				NYS Rte 37 Rebuild Part 2 32358	C081821	870	0	0	0	0	870
				NYS Rte 37 Rebuild Part3 32358	C081823	0	0	10	570	0	580
				Patroon Construct New Feeders	C081583	0	0	70	700	2,100	2,870
				Port Henry 52 - Convert Broad St.	C081530	15	354	0	0	0	369

				Quail Hollow Station Demolition	C092487	0	0	5	20	0	25
				Queensbury 52 - Convert Montray Rd	C092240	0	0	196	0	0	196
				Queensbury 55 - Convert Jerome Ave	C092243	0	0	280	0	0	280
				River Rd Reconfiguration 98351	C089369	286	0	0	0	0	286
				Riverside Dr Conversion 83951	C089389	86	0	0	0	0	86
				Riverside Sta - Spare 9.375MVA Xfmr	C090650	519	0	0	0	0	519
				Ruth Road 38152 conversion	C088203	417	0	0	0	0	417
				Sharon 51 Rearlot Removal Hoose Rd	C092362	15	165	0	0	0	180
				Sherman Ashville 863 D Transfer	C084806	102	0	0	0	0	102
				Sodeman Rd 130152 Middle Grove Rd	C085803	151	0	0	0	0	151
				Soft Maple Rd Conversion 81556	C085999	607	607	0	0	0	1,214
				Sorrell Hill Rebuild	C077170	500	550	1,300	6,359	4,018	12,726
				South Oswego- Whitaker Resiliency	C090776	350	1,300	100	0	0	1,750
				Spare 01- 115/13.8kV (24/32/40)	C090846	836	0	0	0	0	836
				Spare 03- 34.5/13.8kV dy (10/12.5)	C090849	393	393	0	0	0	786
				Spare 04- 34.5/13.8kV YY (10/12.5)	C090850	413	413	0	0	0	825
				Spare 05- 34.8/4.16kV YY(5/6.25)	C090851	705	0	0	0	0	705
				Spare 06- 34.5/4.8kV dd (7.5/9.375)	C090852	767	0	0	0	0	767
				Spare 07- 23/4.16kV (3.75/4.687)LTC	C090853	586	0	0	0	0	586
				State HWY 58 Relocation 98352	C077861	327	0	0	0	0	327
				Stoner 53 - 477 to County Hwy 107	C091771	1,826	0	0	0	0	1,826
				Stuyvesant 51 Hudson 52 Loop Scheme	C091673	0	15	235	0	0	250
				Stuyvesant 51 Rossman Rd Rear Lot	C093367	0	20	0	60	0	80
				Swaggertown 52 - Charlton Rd Conver	C084210	109	0	0	0	0	109
				Targeted UG - Grooms Rd Tie	C093862	0	20	1,313	0	0	1,333
				Transf Dist Fdrs -Tona L622-624	C084807	5	7	0	0	0	12
				Union St 52 - Greene/King Rd Conver	C056649	0	300	0	0	0	300
				Union St 54 - Brownell Corner Rd	C081741	0	256	0	0	0	256
				Unionville 52-Convert Delmar 27941	C089575	1,159	0	0	0	0	1,159
				Upstate NYE Dist Verizon Disco FY24	C093061	815	0	0	0	0	815
				Upstate NYW Dist Verizon Disco FY24	C093062	68	0	0	0	0	68
				Vail Mills 52 - Crooked St Rebuild	C092244	0	0	0	840	0	840
				Valkin 53-Kinderhook St Conversion	C083943	509	0	0	0	0	509
				Valkin 54 Running Creek Conversion	C081570	0	0	20	406	0	426
				Valley 10-4457 Triple Circuit Poles	C087535	59	0	0	0	0	59
				West Road Conversion 77353	C089363	431	0	0	0	0	431
				Wetzel Rd 55 Delta Conversion	C094192	0	0	0	240	940	1,180
				Whitehall 51 - Cty Hwy 21 Reloc.	C090541	134	0	0	0	0	134
				Wilton 51 - Ballard Rd Relocation	C090565	94	0	0	0	0	94
				Yahnundasis-Oneida Tie Part 1	C092395	1,139	0	0	0	0	1,139
				Yahnundasis-Oneida Tie Part 2	C092396	48	211	0	0	0	259
			Reliability Total			**36,274**	**31,529**	**31,696**	**31,818**	**19,376**	**150,692**
			Side Tap Fusing	IE - NW Side Tap Fusing	C015509	50	500	500	500	500	2,050
			Side Tap Fusing Total			**50**	**500**	**500**	**500**	**500**	**2,050**
			Storm Hardening	Battenkill 57-FY17 Storm Hardening	C057386	99	0	0	0	0	99
				Scofield 53 - FY16 Storm Hardening	C057289	0	320	0	0	0	320
				Wethersfield 2361 - Storm Hardening	C057411	0	210	0	0	0	210
			Storm Hardening Total			**99**	**530**	**0**	**0**	**0**	**629**
			Substation Flood Mitigation	Union Falls Flood Mitigation_Dline	C068248	0	100	228	0	0	328
			Substation Flood Mitigation Total			**0**	**100**	**228**	**0**	**0**	**328**
			Substation Mobile	Port Sub 3 4 - Old Buff Sty Rebuild	C086912	430	0	0	0	0	430
			Substation Mobile Total			**430**	**0**	**0**	**0**	**0**	**430**
		Reliability Total				**45,999**	**47,730**	**46,030**	**48,108**	**35,370**	**223,237**
			FLISR	NY FLISR Central - D-line	C080088	4,041	12,975	13,200	13,200	12,975	56,391
				NY FLISR East - D-line	C080089	4,117	12,975	13,200	13,200	12,975	56,467
				NY FLISR West - D-line	C080090	4,117	12,975	13,200	13,200	12,975	56,467
			FLISR Total			**12,275**	**38,925**	**39,600**	**39,600**	**38,925**	**169,325**
			Microgrid	Energy Storage Order Upgrades	C085964	351	2,700	7,358	4,658	0	15,066
				Gilmantown Energy Storage	C084937	0	80	180	5,300	11,500	17,060
				Ticonderoga Energy Storage Project	C091920	1,500	15,000	15,000	70,000	80,000	181,500
			Microgrid Total			**1,851**	**17,780**	**22,538**	**79,958**	**91,500**	**213,626**

		Resiliency	Targeted Feeder Tie Enhancements	*Create Full tie F18251 to F18254	C049882	0	0	20	1,500	0	1,520
				*Firehouse Rd Station - New Feeder	C050081	0	0	24	1,900	0	1,924
				*Hoosick 31451 - Conversion	C050082	0	0	0	500	0	500
				*McClellan 51 - Union ST Conversion	C050085	15	812	0	0	0	827
				*Middleport F7765 Tie w/Shelby 7656	C049711	0	0	16	1,800	0	1,816
				*Rbld/Conv to Create tie F7652-7651	C049802	0	0	0	1,000	0	1,000
				*Rebuild Darien F1662 Limited Tie	C049634	0	0	0	0	500	500
				*Selkirk 14951 -Thatcher/River Conv	C049985	0	0	0	0	8	8
				*Weibel 56 - Wall Street Rebuild	C051325	0	0	0	0	9	9
				*Wilton 52 - Rt 32 3 Phase Ext.	C019570	0	495	0	0	0	495
				Antwerp Feeder Tie Part 1	C081806	475	0	0	0	0	475
				Antwerp Feeder Tie Part 2	C081807	10	473	0	0	0	483
				ARBP Ballina - Ridge feeder Tie	C092476	250	0	0	0	0	250
				ARBP Lorings-Truxton tie phase 1	C092638	574	40	0	0	0	613
				ARBP Lorings-Truxton tie phase 2	C092639	62	677	0	0	0	739
				ARBP Lorings-Truxton tie phase 3	C092640	0	0	250	0	0	250
				ARBP- Salisbury 53 to 56 Tie Part 1	C092580	347	0	0	0	0	347
				ARBP- Salisbury 53 to 56 Tie Part 2	C092583	198	0	0	0	0	198
				Chasm Falls Internal Tie Part 1	C081808	469	0	0	0	0	469
				Chasm Falls Internal Tie Part 2	C081810	244	0	0	0	0	244
				Clinton 36653-54 Conversion Tie	C053628	0	285	0	0	0	285
				Delameter F9356-express& rebuild	C047877	24	80	186	490	36	816
				Delameter new F9355 - express..	C047885	5	8	23	162	3	200
				Delanson 51-Burdeck 54 Tie	C083540	613	0	0	0	0	613
				East Worcester 18924 Feeder Tie	C094409	0	0	500	2,000	0	2,500
				Emmet 25605 - Stuben St Conversion	C088350	0	0	291	0	0	291
				fdr tie Gilbert Mills - New Haven	C094367	0	0	1,600	1,600	0	3,200
				Feeder 03_17063 Tie with Feeder 17163	C094411	0	0	0	0	2,270	2,270
				Feeder 03_7161 Tie with Feeder 9363	C094342	0	0	0	0	0	0
				Feeder 04_0456 Tie with Feeder 5053	C094406	0	0	0	2,000	2,000	4,000
				Feeder 05_5051 Tie with Feeder 5053	C094388	0	0	0	1,000	2,000	3,000
				Feeder 06_9561 Tie with Feeder 06_7863	C094382	0	0	0	1,000	2,000	3,000
				Feeder 07_18151 Tie with Feeder 9354	C094413	0	0	0	51	608	659
				Feeder 08_15351 Tie with Feeder 15353	C094407	0	0	0	0	1,333	1,333
				Feeder 09_15054 Tie with Feeder 6861	C094414	0	0	0	0	300	300
				Florida 51 - Fort Hunter Road	C050693	0	0	5	852	0	857
				Fort Gage 54 - Route 9L Rebuild	C050680	8	844	0	0	0	853
				Gloversville 53-Stoner 53 Tie	C092238	641	0	0	0	0	641
				Grand St 51- I-88/St Hwy 145 NO Tie	C088578	219	0	0	0	0	219
				Lehigh 53/Rome 54 Tie Recon. P1	C094422	0	0	0	0	1,770	1,770
				Milton Ave DLine	C046643	334	2,467	2,761	0	0	5,561
				MSH Create Fdr Tie F1162 to F2761	C082105	400	0	0	0	0	400
				MSH Create Fdr Tie F1361 to F1161	C082053	235	0	0	0	0	235
				MSH Create FDR Tie F7363 to F9261	C082094	0	5	810	0	0	815
				MSH Create tie F215452 to F21258	C087703	0	0	320	0	0	320
				MSH Create Tie F5157 toF438151	C082085	468	469	0	0	0	937
				MSH Rebuild F14271 improve tie	C087701	0	0	161	0	0	161
				MSH Upgrade Limited Tie to F7656	C082089	15	650	0	0	0	665
				MSH Upgrade Limited Tie to F9562	C082104	0	0	229	0	0	229
				MSH Upgrade Ltd. Tie F2952 to F2851	C082108	0	0	674	0	0	674
				MSH-Remove N Angola from 07-9352	C082082	260	0	0	0	0	260
				MSH-SWellsville Tie New Whitesville	C082109	0	10	800	0	0	810
				MV-Rome 54-Oswego Rd Reconductoring	C050098	160	0	0	0	0	160
				New Thousand Islands 81457 Feeder	C081805	90	270	500	2,400	3,424	6,684
				North Shore Study	C091758	0	0	100	250	2,000	2,350
				Rock City 73/Salisbury 53 Tie	C094375	0	0	0	650	0	650
				Rock City Station - 13.2kV Rebuild	C046671	167	4,813	1,008	0	0	5,988
				Rock City Sub - Distribution Line	C082291	63	1,087	5	0	0	1,156
				Rome 54 12kV Conversion	C094421	0	0	0	450	0	450
				Shore Rd 28186 - Elnora 55 Transfer	C067867	0	588	477	0	0	1,065
				Stow 5261 to Chautauqua 5761 Tie	C091242	437	0	0	0	0	437

				Targeted fdr ti Cuyler-Delphi Dline	C094340	0	0	0	0	1	1
				Targeted fdr tie Truxton -Mcgraw	C094337	0	0	0	1	1	2
				West Cleveland-Colosse Tie	C081844	15	621	0	0	0	636
				Targeted Feeder Tie Enhancements Total		**6,799**	**14,692**	**10,759**	**19,606**	**18,263**	**70,119**
			Climate Vulnerability	CCRP Transformer Ambient Temp Central	C094208	0	229	314	468	459	1,471
				CCRP Transformer Ambient Temp East	C094217	0	229	314	468	459	1,471
				CCRP Transformer Ambient Temp West	C094216	0	229	314	468	459	1,471
				CCVS (Flood) Front St Station	C094040	0	0	500	0	0	500
				CCVS (Flood) Riverside Station 288	C093553	0	0	0	0	700	700
				CCVS(Flood)Gloversville Station 72	C093814	0	0	0	900	1,000	1,900
				CCVS(Flood)Peterboro 514-Flood Wall	C093813	0	0	0	1,100	300	1,400
				Dist Line CCRP Projects - NYC	C094130	0	4,287	6,686	9,532	9,507	30,013
				Dist Line CCRP Projects - NYE	C094132	0	4,287	6,686	9,532	9,507	30,013
				Dist Line CCRP Projects - NYW	C094133	0	4,287	6,686	9,532	9,507	30,013
				Targeted UG CCRP Projects - NYC	C094138	0	0	1,833	5,000	5,000	11,833
				Targeted UG CCRP Projects - NYE	C094140	0	0	1,833	5,000	5,000	11,833
				Targeted UG CCRP Projects - NYW	C094141	0	0	1,833	5,000	5,000	11,833
				Climate Vulnerability Total		**0**	**13,550**	**27,000**	**47,000**	**46,900**	**134,450**
			Survivability	Teall - Oneida #5 Resiliency - Sub	C089388	302	0	0	0	0	302
				Survivability Total		**302**	**0**	**0**	**0**	**0**	**302**
			Resiliency Total			**21,226**	**84,947**	**99,897**	**186,163**	**195,588**	**587,822**
		Communications/ Control Systems	**Radios**	D-Line Comms Redundancy	C084931	0	350	0	0	0	350
				Radios Total		**0**	**350**	**0**	**0**	**0**	**350**
			Meter Installations	AMI - Field Area Networks (FANs) C	C087157	4,595	199	149	0	0	4,943
				AMI - Field Area Networks (FANs) E	C084958	4,595	199	149	0	0	4,943
				AMI - Field Area Networks (FANs) W	C087158	4,595	199	149	0	0	4,943
				Meter Installations Total		**13,786**	**597**	**448**	**0**	**0**	**14,830**
			Substation RTU	EMS/RTU for DSCADA	C077972	1,704	3,000	3,000	3,000	3,000	13,704
				EMS/RTU INSTALLS - NY CENTRAL	C076124	0	4,000	4,000	4,000	4,000	16,000
				EMS/RTU INSTALLS - NY EAST	C076123	1,000	4,000	4,000	4,200	3,720	16,920
				EMS/RTU INSTALLS - NY WEST	C076125	2,000	4,000	4,000	4,000	4,000	18,000
				NYC Dist Telecom DC Battery Repl Program	C094318	16	67	67	67	67	285
				NYE Dist Telecom DC Battery Repl Program	C094319	16	67	67	67	67	285
				NYW Dist Telecom DC Battery Repl Program	C094320	16	67	67	67	67	285
				Substation RTU Total		**4,752**	**15,202**	**15,202**	**15,402**	**14,922**	**65,479**
			Telecom	Dark Fiber IRU Distribution	C090332	72	0	0	0	0	72
				Dist Comms - Clean Inno. Proj.	C084928	250	250	0	0	0	500
				Dist RE43 Switch Prog NYCD	C094395	15	100	100	100	100	415
				Dist RE43 Switch Prog NYED	C094374	15	100	100	100	100	415
				Dist RE43 Switch Prog NYWD	C094397	15	100	100	100	100	415
				DMX Projects - Central	C088464	500	1,000	1,200	1,350	1,500	5,550
				DMX Projects - East	C084927	500	1,000	1,200	1,350	1,500	5,550
				DMX Projects - West	C088470	500	1,000	1,200	1,350	1,500	5,550
				EMS/RTU TELECOM - DLINE NY CENT	C076112	50	100	100	100	100	449
				EMS/RTU TELECOM - DLINE NY EAST	C076111	50	100	100	100	100	450
				EMS/RTU TELECOM - DLINE NY WEST	C076122	50	100	100	100	100	450
				EMS/RTU TELECOM - STATIONS NY CENT	C076108	600	1,200	1,200	1,200	1,200	5,400
				EMS/RTU TELECOM - STATIONS NY EAST	C076107	600	1,200	1,200	1,200	1,200	5,400
				EMS/RTU TELECOM - STATIONS NY WEST	C076110	600	1,200	1,200	1,200	1,200	5,400
				NYCD Dist Microwave Network	C094104	150	600	600	1,200	1,200	3,750
				NYCD Dist Private Fiber	C094107	50	200	400	400	400	1,450
				NYCD Dist Satellite Network	C094110	0	120	300	1,300	1,300	3,020
				NYCD Dist Verizon Disconnects	C094101	500	480	480	480	480	2,420
				NYED Dist Microwave Network	C094105	150	600	600	1,200	1,200	3,750
				NYED Dist Private Fiber	C094108	50	200	400	400	400	1,450
				NYED Dist Satellite Network	C094111	0	120	300	1,300	1,300	3,020
				NYED Dist Verizon Disconnects	C094102	502	450	400	400	500	2,252
				NYWD Dist Microwave Network	C094106	625	750	711	1,000	1,000	4,086
				NYWD Dist Private Fiber	C094109	50	200	400	400	400	1,450
				NYWD Dist Satellite Network	C094112	0	120	300	1,300	1,300	3,020
				NYWD Dist Verizon Disconnects	C094103	500	480	480	480	480	2,420

				OpTel - DWDM - Central	C088717	177	1,000	1,200	1,200	1,500	5,077
				OpTel - DWDM - East	C088747	391	1,000	1,200	1,200	1,500	5,291
				OpTel - DWDM - West	C088718	32	1,000	1,200	1,200	1,500	4,932
				Syracuse NZE Housing - CIP	C087889	302	399	301	0	0	1,002
				Telecom and Radio Equipment	C004157	500	995	1,000	1,000	1,000	4,495
				Telecom D Central Dark Fiber	C091330	1,208	2,500	2,750	3,250	3,500	13,208
				Telecom D East Dark Fiber	C091326	1,208	2,500	2,750	3,250	3,500	13,208
				Telecom D West Dark Fiber	C091331	1,208	2,500	2,750	3,250	3,500	13,208
				Verizon DS0 Repl. (D-SCADA) Central	C084926	2,163	2,500	3,000	3,250	4,250	15,163
				Verizon DS0 Repl. (D-SCADA) East	C084929	2,242	2,500	3,000	3,250	4,250	15,242
				Verizon DS0 Repl. (D-SCADA) West	C088463	2,044	2,500	3,000	3,250	4,250	15,044
			Telcom Total			**17,868**	**31,164**	**35,322**	**42,210**	**47,410**	**173,974**
		Communications/Control Systems Total				**36,406**	**47,312**	**50,971**	**57,612**	**62,332**	**254,633**
		DER Electric System Access	**Company Owned DER**	Kenmore Station 22 Energy Storage	C093917	0	0	10	40	1,050	1,100
			Company Owned DER Total			**0**	**0**	**10**	**40**	**1,050**	**1,100**
		DER Electric System Access Total				**0**	**0**	**10**	**40**	**1,050**	**1,100**
		Non-Infrastructure	**Radios**	LMR Land Mobile Radio Sys	C086110	400	500	500	500	500	2,400
			Radios Total			**400**	**500**	**500**	**500**	**500**	**2,400**
			Blanket	Cent NY-General-Genl Equip Blanket	CNC0070	1,328	1,368	1,409	1,495	1,540	7,139
				East NY-Genl Equip Budgetary Reserv	CNE0070	1,374	1,447	1,496	1,546	1,593	7,456
				West NY-General-Genl Equip Blanket	CNW0070	1,284	1,151	1,186	1,258	1,296	6,175
			Blanket Total			**3,986**	**3,966**	**4,091**	**4,299**	**4,428**	**20,769**
		Non-Infrastructure Total				**4,386**	**4,466**	**4,591**	**4,799**	**4,928**	**23,169**
	Local Rates Total					**680,795**	**918,079**	**897,976**	**1,107,336**	**1,087,602**	**4,691,788**
Local Total						**680,795**	**918,079**	**897,976**	**1,107,336**	**1,087,602**	**4,691,788**
Local Supplemental	**EV MRP**	**Customer Request/Public Requirement**	**New Business**	Electric Transp. Initiative-FTM NYC	C086719	1,500	1,897	2,925	3,648	4,000	13,970
				Electric Transp. Initiative-FTM NYE	C085240	1,500	1,897	2,925	3,648	4,000	13,970
				Electric Transp. Initiative-FTM NYW	C086718	1,500	1,897	2,925	3,648	4,000	13,970
			New Business Total			**4,500**	**5,691**	**8,775**	**10,944**	**12,000**	**41,910**
		Customer Request/Public Requirement Total				**4,500**	**5,691**	**8,775**	**10,944**	**12,000**	**41,910**
	EV MRP Total					**4,500**	**5,691**	**8,775**	**10,944**	**12,000**	**41,910**
	Cost Share 2.0	**System Capacity - NY**	**Load Relief**	Targeted Host Cap Upgrades Dist-NYC	C091880	0	7,500	7,500	7,500	7,500	30,000
				Targeted Host Cap Upgrades Dist-NYE	C091879	0	7,500	7,500	7,500	7,500	30,000
				Targeted Host Cap Upgrades Dist-NYW	C091882	0	7,500	7,500	7,500	7,500	30,000
			Load Relief Total			**0**	**22,500**	**22,500**	**22,500**	**22,500**	**90,000**
		System Capacity - NY Total				**0**	**22,500**	**22,500**	**22,500**	**22,500**	**90,000**
	Cost Share 2.0 Total					**0**	**22,500**	**22,500**	**22,500**	**22,500**	**90,000**
Local Supplemental Total						**4,500**	**28,191**	**31,275**	**33,444**	**34,500**	**131,910**
Regional	**CLCPA Ph2A**	**System Capacity - NY**	**Load Relief**	Bremen Substation Upgrades	C090030	0	0	11	1,186	27	1,224
				East Watertown Substation Upgrades	C090048	933	0	0	0	0	933
				North Carthage Substation Upgrades	C090054	37	2,455	9	0	0	2,501
			Load Relief Total			**970**	**2,455**	**20**	**1,186**	**27**	**4,658**
		System Capacity - NY Total				**970**	**2,455**	**20**	**1,186**	**27**	**4,658**
	CLCPA Ph2A Total					**970**	**2,455**	**20**	**1,186**	**27**	**4,658**
Regional Total						**970**	**2,455**	**20**	**1,186**	**27**	**4,658**
Grand Total						**686,265**	**948,725**	**929,271**	**1,141,966**	**1,122,129**	**4,828,356**

Exhibit 4: Non-Wires Alternatives Update

National Grid has adopted guidelines for the review and consideration of Non-Wires Alternatives ("NWA") in its planning processes. The guidelines outline two stages of review: the first is to identify potential areas of need where an NWA may be feasible, and the second is to determine NWA feasibility and design. The first stage is completed by Transmission and Distribution Planners as they review potential capital investment needs. The second stage is completed by Project Managers in the Company's NWA Team who coordinate procuring solutions for the identified areas.

NWA Suitability Review

The initial review for projects with NWA potential takes place when the Company's Transmission and Distribution Planning groups conduct their annual capital needs assessment. During the Capital Investment Plan ("CIP") development, the Company screens for potential NWA opportunities according to the criteria in the table below.

Criteria	Potential Elements Addressed
Project Type Suitability	Project types include Load Relief and Reliability. Other types have minimal suitability and will be reviewed as suitability changes due to State policy or technological changes.
Timeline Suitability	18 months minimum prior to the date of the system need
Cost Suitability	Greater than or equal to $500K

NWA RFP Development

The Company begins the Request for Proposal (RFP) development process after completion of the NWA suitability review and confirmation that feasibility for a specific project has been determined.

The RFP development process involves compiling information that best describes the area's electric system requirements. Information provided in the RFP includes historical electric load data, aggregated customer information, detailed description of equipment and stresses on equipment, geographic data, circuitry, load forecasts (daily and yearly), project economics in the form of the value of the deferred traditional solution, and other information that may help vendors understand the project scope. The team also considers pairing NWA need statements with internal programs such as Energy Efficiency (EE), Demand Response (DR), and other similar targeted distribution programs.

Once the circumstances and load drivers are developed, the RFP is filed and released to potential bidders through the Company's procurement site Ariba. The RFP is also available on the Company's NWA website. The Company then holds a pre-bid teleconference during which the Company presents an overview of the NWA opportunity and requests potential bidders to ask questions. Answers and information for questions are compiled by the procurement team with the input of the appropriate subject matter experts and then posted on the procurement site. Potential bidders develop proposals and submit them into Ariba. Proposals are reviewed and ranked by

the NWA review team which includes Company representatives from procurement, NWA, legal, operations, control center, permitting, transmission/distribution planning, IT & Cyber Security, and other subject matter experts, as appropriate. The procurement team will be running a pilot using the Piclo Flex platform to release RFPs through fall of 2024. The intent of the pilot is to move away from a closed RFP model to a more open market-based model as part of the company's DSO transition plan.

Those projects that are most affordable and viable, *i.e.*, those that can solve the electrical problem described in the RFP, may be contacted for additional details and clarifications. A preliminary Benefit-Cost Analysis ("BCA") score is calculated and revised with additional information and/or adjustments to the proposed solution. The NWA team then chooses the preferred bidder(s) who offer the Non-Wires Solution that maintains electrical system reliability, delivery standards, and safety, and scores a 1.0 or higher according to the BCA calculation. If an award is made to the preferred bidder(s), then contract negotiations and terms are discussed; if contract terms are reached, then the NWA solution may be implemented.

Projects Reviewed

In response to the "Order Adopting Regulatory Policy Framework and Implementation Plan" issued by the Commission in Case 14-M-0101 and in consideration of NWA discussions with Staff, as of December 2023, the Company has developed and issued 13 RFPs.

The current list of projects being considered for an NWA opportunity is provided in the table below. In 2023, the Company reviewed all capital projects and created NWA opportunities for those that satisfied the criteria for potential NWA solutions described in the table above. Many of the projects reviewed did not pass the NWA suitability criteria. Though they were driven by asset condition issues or resiliency needs, the projects had need dates that were too immediate or cost estimates that did not meet the criteria.

The table below lists currently active NWA projects and their status:

Project Name	Project Type	Status	Voltage Type	Estimated RFP Timing (CY)
Pine Grove (New Cicero) Substation DSUB & D-LINE	Reliability	Operational	Distribution	RFP Closed
Sawyer 11H Sub-T Line *Former Buffalo 23KV*	Load Relief	Planner Review	Sub-Transmission	RFP Closed
New Krumkill	Load Relief	Planner Review	Distribution	RFP CY24
Watertown New 115/13.2 KV Substation	Reliability	Construction	Distribution	RFP Closed
Gilmantown	Reliability	Planner Review	Distribution	RFP CY24

Lessons Learned

National Grid has evolved its process to incorporate lessons learned and to improve NWA evaluation. The Company provides improved information about project needs in the problem statement and the value of the deferred traditional solution to better compare with NWA solution costs. Improvements to the RFP process include:

- Inclusion of details on telemetry and communication protocol and expectations
- Providing greater clarity for NWA contract terms and performance expectations for third party ownership
- Discussing contract structure and performance expectations in the RFP and evaluation process with the active bidders

- Inclusion of sample terms and conditions
- Updates to the RFP template so that bidders have a clearer understanding of the project
- Use of a standard template to provide a common format across all RFPs
- Property acquisition responsibility
- Development of a template for the pricing structure of proposals
- Additional electrical system information to help bidders develop more complete proposals
- Continued improvements to the BCA tool to ensure NWA benefits are appropriately considered
- Incorporating checklists of the items needed for the Company to thoroughly review proposed solutions
- Extending time for proposal development
- Better aligning the proposal content requested with the needs of the internal reviewers
- Providing an approximate value of a potential NWA solution so potential bidders can determine if their NWA solution is cost-competitive when compared to the traditional wires solution
- Greater collaboration between the Demand Response programs and the Energy Efficiency Programs. The Company has worked to optimize the locational offerings between NWA procurements and any applicable Demand Response Programs, including the new Term and Auto DLM programs which require coordination on locational offerings. In addition, a kicker was introduced within the Energy Efficiency portfolio in 2020 which is focused on an NWA location for peak reduction benefits. The Company is in the process of evaluating this offering for additional opportunities.
- Expanding the customer demographic for the EE kicker to go beyond large commercial and industrial customers and include further customers like small business. The Company is working on ensuring there are internal processes to be able to pair the NWA program with internal programs such as EE.
- The Company continues to evaluate NWA potential opportunities for constrained areas including using a bridge-to-wires solution that could apply interim load relief and benefit customers in a safe and reliable service.

Conclusion

NWA projects and processes are under continuous improvement to incorporate lessons learned and industry best practices. The Company will continue to evaluate projects according to the suitability criteria to identify potential NWA projects for 2024 and beyond. The Company will also continue to work in conjunction with the Joint Utilities ("JU") to incorporate lessons learned from the JU group, as appropriate. Additionally, the Company is coordinating with internal programs such as DLM and EE programs to optimize NWA offerings and better integrate and leverage customer DERs as "demand-side" NWA solutions to targeted distribution system needs.

Exhibit 5: Overhead Line Refurbishment Projects

Amsterdam-Rotterdam 3/4 Relocation (C081471 - $1.2M)

The overhead line details:

- Total length: 10.1 miles
- Conductor: 4/0 AWG 7-Strand Copper
- Total number of structures: 111
- Number of wood structure units: 0
- Number of steel structure units: 111
- Types of structures: Double circuit; steel flex & steel box
- Typical Installation date: 1921

This is an ACR type project to rebuild a 0.75-mile line segment between structures #77 and #85, which is currently in the old Erie Canal bed and inaccessible. The project rebuilds the structures outside of the old canal bed to ensure future accessibility.

Border City – Elbridge 10-979 / 5 (C075723 - $15.8M)

The overhead line details:

- Total length: 31.4 miles total
- Conductor: 336.4 30/7 ACSR “Oriole” (installed in 1922)
- Total number of structures: 432
- Number of wood structure units: 117
- Number of steel structure units: 315
- Types of structures: Double circuit, primarily consisting of steel lattice towers
- Typical Installation date: Parts originally built in 1906 and operated at 66kv 25 cycle until upgraded to current 115kV 60 cycle in 1948. Circuits originally referred to as Mortimer-Geres Lock #3/Geneva-Geres Lock #4.

This project targets the double circuit Border City – Elbridge #10-979 and the de-energized Mortimer - Solvay #5.

This project will replace structures and conductor at 17 significant road crossings to ensure public safety and reliability. The existing suspension structures will be replaced with direct embedded steel poles with guy wires. The conductor will be replaced across the road as well as all insulators and hardware.

Brockport Taps ACR (Lockport-Mortimer 111 & 113 Brockport Tap) (C055531 - $25.6M)

The overhead line details:

- Total length: Approximately 7.5 miles
- Conductor: 795 kcmil, 4/0 and 336.4 ACSR
- Number of steel structure units: 1 (steel lattice switch structure)
- Number of wood structure units: 39
- Typical Installation Date: (1) 1940s for the #111 tap and (2) 1955 for the #113 tap

This project involves a 3-mile portion of the 7.5-mile tap between the Sweden and Brockport stations and taps off the Lockport-Mortimer 111 and 113 lines.

The project scope includes replacement of deteriorated structures, damaged insulators and fittings, conductor splices and new shield wire.

Clay to Wetzel Tap (C069533 - $2.0M)

The overhead line details:

- Total length: 0.36 miles
- Conductor: 795 ACSR proposed
- Total number of structures: 5 proposed
- Number of wood structure units: 0
- Number of lattice structure units: 0
- Types of structures: 5 proposed
- Typical Installation date: 1962

This project is to remove the Wetzel Tap from the mainline Lighthouse Hill-Clay #7 and place it on a dedicated/spare bay within the Clay substation. The project involves construction of approximately 0.36 miles of new overhead 115kV on steel poles. The 0.36 miles is measured from the new bay within the Clay substation to existing Str. 310 on the Wetzel Rd Tap. This is a reliability project to place the customers on the Wetzel Rd substation on a more reliable source.

Curtis St - Teall #13 ACR (C084496 - $16.6M)

The overhead line details:

- Total length: 28.83 miles
- Conductor: 636 ACSR 18/1, 636 ACSR 26/7, 795 ACSR 26/7, and 795 ACSR 36/1
- Total number of structures: 203
- Number of wood structure units: 201
- Number of lattice structure units: 183
- Types of structures: Square based lattice dead-ends, steel channels for flex, and single and wood H-frame
- Typical Installation date: 1945

This project will replace wood structures that are deteriorated, and paint towers to extend its life. Additionally, substandard clearances will be corrected to meet NESC clearance requirements.

Feura Bush – N. Catskill 2 ACR (C083073 - $2.7M)

The overhead line details:

Feura Bush – N. Catskill 2

- Conductor Types: 4/0 CU, 336 ACSR
- Total number of structures: 211
- Total Steel: 190
- Total Wood: 21
- Installation Date: Powerplant records date back to the 1920s and 1930s for the in

North Catskill – Churchtown #5

- Conductor Types: 605 ACSR, 336 ACSR
- Total number of structures: 186
- Total Steel: 183
- Total Wood: 3
- Installation Date: Powerplant records date back to the 1920s and 1930s for the corridor.

This project will replace shield wire with OPGW and replace insulators in kind on the 115kV Feura Bush – North Catskill #2 line and the portions of the Long Lane – Lafarge #6 and Lafarge Pleasant Valley #8 lines that are on the same towers. In addition, this project will continue the replacements in the corridor an additional 8.5 miles to Churchtown substation on the North Catskill to Churchtown #5. This will be the new end of the corridor once EHI Segment B is completed. The shield wire in this corridor is in poor shape and failed testing. Additionally, the insulators are in need of replacement with many found to be flashed over and/or broken/chipped.

Gardenville-Dunkirk 141 & 142 Northern Phase Rebuild (C003389 - $35.0M)

The overhead line details:

- Total length: Approximately 20 miles
- Conductor: Varies – 250 BSCU, 4n00 BSCU, 4/0 BSCU, 336.4 ACSR, and 636 AAC, and 795 ACSR.
- Total number of steel structures: 250
- Types of structures: Double circuit, primarily steel (Z type flex)
- Typical Installation date: 1930s vintage

This project involves rebuilding the Gardenville-Dunkirk 141 (T1260) and the Gardenville-Dunkirk 142 (T1270) 115 kV transmission circuits between Gardenville and North Angola.

Planning needs require a larger conductor on the lines due to thermal overloads during periods of low Western NY load and high imports from Canada. The rebuilding of the Northern Phase will be done first with an expected in-service date of FY22. The Southern phase will proceed with the completion of the Northern phase. After climbing steel towers to perform conductor clearance work in advance of the line refurbishment, it was revealed that many towers were in worse condition than originally thought. Further climbing inspections and aerial photography were ordered. The results drove a decision to change the scope from a life extension project involving the targeted replacement of deteriorated structures, insulators and fittings, conductor splices, shield wire, tower painting, and footer repairs to a full line rebuild. An Article VII application is currently underway.

Gardenville-Dunkirk 141-142 Southern Phase ACR (C081744 - $27.6M, C081750 $1.5M, C034193 - $8.4M)

The overhead line details:

- Total length: 25 miles
- Conductor: 4/0 ACSR, 795 ACSR, 336.4 ACSR, and 636 Al
- Total number of structures: 326
- Number of wood structure units: 18
- Number of steel structure units: 308
- Types of structures: Steel square base lattice for dead-ends and steel channels for flex
- Typical Installation date: 1920

This project is the second half of the 141/142 ACR project. It will address the southern portion from the North Angola Substation (T#249) to the Dunkirk substation (T#581). The Northern Phase from Gardenville to North Angola Substation is currently in construction.

Gardenville – Homer Hill 151-152 T1950 – T1280 S ACR (C027425 - $9.3M)

The overhead line details:

- Total length: 37.25 miles
- Conductor: 336.4 ACSR 30/7 “Oriole”
- Total number of structures: 346
- Number of wood structure units: 21
- Number of lattice structure units: 325
- Types of structures: Steel lattice structures and Wooded suspension structures
- Typical Installation date: 1922

This project will address the asset condition issues on the 115kV Gardenville-Arcade #151/115kV Gardenville-Five Mile Road #152/115kV Arcade-Five Mile Road #167 lines. The circuits were initially referred to as the Gardenville-Homer Hill 151/152 in 1922 when they were placed into service but, the Arcade and Five Mile Rd substations were added, and the circuits were renamed.

A comprehensive inspection was conducted on the lines, and it was found that the hardware and steel towers were deteriorating. Conductor testing was also done to further investigate the condition of the line. Overall, the inspection and testing found that the conductor, hardware, and steel structures were showing signs of heavy deterioration. Previously, the segment from the

Gardenville substation to structure 199 was rebuilt due to the same concerns as the segment addressed in this project (structure 200 to 546). It is proposed that similar actions should be taken for the remaining segment.

Gloversville – Marshville #6 Refurb (C081458 - $33.0M)

The overhead line details:

- Total length: 21.37 miles
- Conductor: 2/0 CU 7s, 3/0 CU 7s, 4/0 CU 7s, 336.4 ACSR 18/1, 795 AL 37/0
- Total number of structures: 356
- Number of wood structure units: 214
- Number of lattice structure units: 142
- Types of structures: Single Wood Pole, Steel Lattice structures
- Typical Installation date: 1911

This project rebuilds roughly 8 miles of 69kV transmission line to 115kV standards. The work will be bundled with the re-build of the 115kV Inghams – Meco #15: Clinton Tap which runs through the same transmission ROW to take advantage of bundling cost savings. Replacement is needed to address the deteriorated assets along the circuit.

Greenbush – N Troy Corridor ACR (C094479 - $13.8M)

The overhead line details:

- Total length: 15.36 miles
- Conductor Types: 795 MCM ACSR, 605 MCM ACSR
- Number of structures: 175
- Total Steel: 117
- Total Wood: 58
- Types of structures: Steel Lattice (57), Steel Other (60), Wood (58)
- Lines:
    - T5570 Reynolds Rd. to Greenbush 9 (Includes bussed section in scope doc)
    - T5930 Wynantskill to Reynolds Rd. 13
    - T5540 North Troy to Reynolds Rd. 16
    - T5550 North Troy to Wynantskill 14
    - T5550-1 Sycaway Tap
    - T5540-1 Sycaway Tap
- Installation Date: 1923 to 1931

This will be 1 of 2 projects that address asset condition related issues on the 115kV corridor from Greenbush substation to Battenkill substation. These assets were installed under the original line from Thompson to Greenbush from 1923 to 1931. They have since been segmented into individual lines as substations have been cut in over the years. This project will replace all insulators with toughened glass and replace 26 structures.

Huntley – Gardenville 38 39 Rebuild (C075543 - $7.4M)

The overhead line details:

- Total length: 23.39 miles (Huntley – Gardenville 38) and 23.37 miles (Huntley – Gardenville 39)
- Conductor: 37/0 AL 636 “Orchid”, 19s 300CU, 18/1 ACSR 636 “Kingbird”, 37s 500CU, 36/1 ACSR 795 “Coot”, 19s 400CU
- Total number of structures: 269
- Number of wood structure units: 9
- Number of lattice structure units: 256 (four regular steel structures)
- Types of structures: Wood (eight single-pole, one three-pole), Steel (three single-pole, one three-pole), Lattice (132 Flex towers, 15 single-pole, 109 square base)
- Typical Installation date: As early as 1907

This project will address the reliability concerns of Huntley – Gardenville #38 and #39. Both lines were identified as candidates for refurbishment based on the history of outages (nine outages over six years), being spot 11 on the Worst Performing Circuits list for 2018 and have a customer count of over 23,000 per line.

Three options were considered. Option 1 will replace “rejected” structures with direct embedded steel poles for tangents and poles on foundations for dead ends, with “adequate” structures having their insulators, vangs, and hardware replaced, alongside painted towers. Option 2 continues off of Option 1 with replacing sections of 300 Copper conductor (8.5 miles) with a hybrid (297 ACCR or 336 ACSS). Option 3 will replace all structures on the line with the same rules from Option 1.

Huntley-Lockport 36/37 Ayer Rd ACR (C081670 - $13.5M)

The overhead line details:

- Total length: 1.17 miles (T1440-3) and 1.34 miles (T1450-3)
- Conductor Types: 636 ACSR
- Number of structures: 27
- Total Steel: 26
- Total Wood: 1
- Typical Installation date: 1929

This project addresses the asset condition related issues on the Huntley-Lockport 36/37 Taps to Ayer Rd. The Huntley-Lockport 36/37 Taps to Ayer Rd are built overhead for 1.17 miles before transitioning underground for 2.5 miles to the Ayer Rd Station. The taps are operating on steel lattice towers from the retired 92E and 92W circuits. These towers are in poor condition and need replacement. The foundations are in crumbling condition, and the steel shows significant oxidation. The preferred option to resolve the condition issue is to rebuild the overhead sections of the taps using direct embedded steel poles. Conductor, shield wire and insulators will also be replaced.

Lockport-Batavia 107 MVT Rebuild (C086920 – $60.5M)

The overhead line details:

- Total length: 35.96 miles

- Conductor: 795 ACSR 36/1 “Coot”
- Total number of structures: 426
- Number of wood structure units: 417
- Number of steel structure units: 9
- Types of structures: Wood 2-Pole H-frames, wood pull-off structures, and steel lattice square base towers
- Typical Installation date: 1967

This project will address the asset condition related issues on the Lockport-Batavia #107 circuit. An aerial inspection conducted on the line in 2023 identified a large population of damaged structures. This damaged pertains to mostly deteriorating wood structures and crossarms due to woodpecker activity and the age of the wood. Broken and flashed insulators were also found on the line. Of the 417 wood structures, a majority are expected to require replacement. Also, system capacity need has been identified by Transmission Planning. A potential 312 MW of customer load has been proposed in the Genesee area and, in the event of an outage on both lines, the system between Lockport and Mortimer would be supported by one set of lines in series. Addressing the asset condition issues and system capacity issues separately would be inefficient and will increase cost.

Lockport-Batavia 108 MVT Rebuild (C086921 – $60.6M)

The overhead line details:

- Total length: Approximately 35.94 miles
- Conductor: Varies - 250 BSCU 19-strand, 795 ACSR 36/1 “Coot”, and 336.4 ACSR 26/7 “Linnet”
- Total number of structures: 327
- Number of wood structure units: 322
- Number of steel structure units: 5
- Types of structures: Wood 2-pole H-frames, wood pull-off structures, steel Lattice Square Base Towers
- Typical Installation date: 1931

This project will address the asset condition-related issues and capacity needs on the Lockport-Batavia #108 circuit. An aerial inspection conducted on the line in 2023 identified a large population of damaged structures. This damaged pertains to mostly deteriorating wood structures and crossarms due to woodpecker activity and the age of the wood. Broken and flashed insulators were also found on the line. Of the 322 wood structures, a majority of these are expected to require replacement. Also, system capacity need has been identified by Transmission Planning. A potential 312 MW of customer load has been proposed in the Genesee area and, in the event of an outage on both lines, the system between Lockport and Mortimer would be supported by one set of lines in series. Addressing the asset condition issues and system capacity issues separately would be inefficient and will increase cost.

Lockport-Batavia 112 (C003422 - $75.7M and C089590 - $5.0M)

The overhead line details:

- Total length: Approximately 34 miles
- Conductor: Varies - 250 BSCU 19-Strand, 795 ACSR 36/1 “Coot”, 336.4 ACSR 26/7 “Linnet”, 428 AAC 19-Strand, and 636 AAC “Orchid”
- Total number of structures: 369
- Number of wood structure units: 156
- Number of steel structure units: 213
- Types of structures: Steel towers (178 of which are tri-leg towers) and wood pole (111 of which are single-pole with davit arms).
- Typical Installation date: 1907

This project is undergoing scope development based upon an engineering field assessment and input from Transmission Planning and local and state agencies. Conductor testing passed all shield wire and conductor types with the exception of 17.5 miles of 428 kcmil AAC. The project scope is a full rebuild to replace deteriorated 1907 vintage steel tri-leg structures and conductor for 20 miles from Lockport station to structure #211. The section of the line through the Tonawanda Nature Preserve will also be relocated to remove it from wetlands. This project will require Article VII filing.

Lockport-Mortimer 113/114 ACR (C081664 - $14.6M)

The overhead line details:

- Total length: 55.51 miles (T1540) and 55.70 miles (T1550)
- Conductor Types: 397.5 30 and 7 ACSR
- Number of structures: 592
- Total Steel: 574
- Total Wood: 18
- Installation Date: 1920

The mainline of the Lockport-Mortimer 111 was rebuilt approximately ten years ago. The mainline of the Lockport-Mortimer 113/114 was partially rebuilt in the same timeframe. During the 113/114 partial rebuild, the insulators and shield wire were replaced. However, the taps were not addressed.

The Lockport-Mortimer 113/114 supports approximately 30,000 customers combined. The 113/114 are also on the National Grid Worst Performing Circuits (“WPC”) list as of June 2019. These circuits have experienced many disturbances over the past years.

Moons – Falconer 175/176 Reinsulated/Laona-Falconer 172/173 ACR (C083216 - $23.8M)

The overhead line details:

- Total length: 23.67 miles (T6640) and 23.71 miles (T6620)
- Conductor Types: 4/0 ACSR and 795 ACSR 26/7
- Number of structures: 248
- Total Steel: 240
- Total Wood: 8

This project addresses the line section from the Laona Substation (Str. 121) to the Falconer Substation (Str. 356).

The 161/162 underwent an aerial comprehensive inspection in 2009. The inspection results, together with momentary data, prompted the ACR inspection. Several instances of flashed insulators and other insulator concerns were observed. The tower vangs also appear to be elongated. The main supporting channels are corroded, and pitting is suspected. Several secondary tower members are also bent.

Samples of the conductor and shield wire were harvested for destructive testing of tension, torsion, and corrosion. All 10 of the #4/0 6/1 ACSR Penguin coupons failed the tensile tests and averaged -4.58% below Rated Breaking Strength.

In May 2014, a shield wire replacement damage failure project was undertaken on the 161/162 to replace two shield wires from Str. 28 to 40, which is a one-mile segment. Replacement of 84 polymer insulators with porcelain and Str. 55 replacement was added to the scope of the project. Both projects are currently in the Dunkirk-Laona 161/162 region.

Mortimer – Pannell 24 25 (C047816 - $101.5M)

The overhead line details:

- Total length: 15.7 miles
- Conductor: 795 ACSR 36/1 “Coot”, 336.4 ACSR 30/7 “Oriole” (installed in 1922), 336.4 AL “Tulip” and 336.4 ACSR 18/1 “Merlin”
- Number of wood structure units: 78
- Number of steel structure units: 172
- Types of structures: Predominantly the original 1906 Aeromotor towers
- Typical Installation date: Parts originally built in 1906 and operated at 66kv 25 cycle until upgraded to current 115kV 60 cycle in 1948. Circuits originally referred to as Mortimer-Geres Lock #3/Mortimer-Geneva #4.

This is a line rebuild project involving the replacement of deteriorated structures, insulators, fittings, and conductor. Conductor testing revealed corrosion of the 336.4 ACSR conductor. The project is in preliminary engineering to further define scope within the term of this plan.

Mortimer-Golah #110 ACR (C060220 - $45.8M)

The overhead line details:

- Total length: 9.58 miles
- Conductor: Mix of 250 BSCU, 397.5 ACSR with a small amount of 795 ACSR
- Total number of structures: 91
- Number of wood structure units: 91
- Number of steel structure units: 0
- Types of structures: H-frames w/ OH shield wire
- Typical Installation date: 1950

This ACR project will evaluate this wood circuit and the 397.5 ACSR conductor. Additionally, transmission planning will be consulted to determine if the 250 BSCU and 397.5 ACSR are regionally limiting elements.

This project will be bundled with the Mortimer-Golah #109 (C081474) in a common corridor. This project and the 109 rebuild are transmission planning sponsored projects to address constraints in the Lockport-Batavia-Golah-Mortimer southern Genesee loop.

Mortimer-Golah 109-69kV Refurb (C081474 - $52.3M)

The overhead line details:

- Total length: 10.29 miles
- Conductor: 795 ACSR 36/1 “Coot” and 214 Alum
- Total number of structures: 235
- Total number of wood structures: 189
- Total number of steel structures: 46
- Installation Date: 1924

This project will be bundled with the Mortimer-Golah #110 (C060220) in a common corridor. The 109 will be built to current 115kv standards for future conversion.

This project and the 110 rebuild are transmission planning sponsored projects to address constraints in the Lockport-Batavia-Golah-Mortimer southern Genesee loop.

New Scotland-Feura Bush #9/Long Lane #7 ACR (C084554 - $21.5M)

The overhead line details:

- Total length: 4.16 miles (T5470) and 4.03 (T5500)
- Conductor Types: 795 MCM ACSR, 4/0 7S CU, and 336.4 MCM
- Total number of structures: 68
- Total Steel: 25
- Total Wood: 43
- Types of structures: Wood pole standoff (18), Wood pole H-Frame (4), Wood pole various (21), Steel lattice (20), and Steel pole (5)
- Installation Date: 1923

This ACR-type project will address asset condition related issues on the 115kv New Scotland-Feura Bush #9 (T5500) and The New Scotland-Long Lane #7 (T5470). These two circuits are primarily run on joint steel structures and wood poles. During our inspections we found tracking and broken glass on many of the insulators and large sections of deteriorated shield wire. Testing on the shield wire showed 50% or less remaining strength on these sections. Additionally, several deteriorated wood poles were found that will need replacement. Under this project we will replace all insulators with toughened glass, replace shield wire, and replace 42 wood pole structures with steel.

NY Transmission UG Strategy (C084550 - $7.3M)

Across upstate New York, National Grid has roughly 53 miles of UG transmission cable from 115kv to 345kV. These 53 miles are divided into two types of cable; 43 miles of high-pressure fluid filled (HPFF) pipe type cable and 10 miles of solid (extruded) dielectric cable. The average age of the HPFF pipe type cable is 47 years with the oldest install dating to 1959. The average age of the solid dielectric cable is 26 years with the oldest install dating to 1988.

These assets have been kept in-service since their in-service date and the Company has taken the approach of fixing problems as they arise. However, as these assets continue to experience increased condition issues, maintaining them has become increasingly difficult and costly. The current condition and difficulty to repair and replace obsolete pipe-type cable equipment places electrical service at risk and raises concerns for our employees and contractors. Increased inspection and maintenance is required to assure these assets continue to provide reliable electric service to our customers based in the deteriorating asset condition.

The goal of this program is to address asset condition issues as these assets reach, or exceed, the end of their useful life and failure risk is high. The determination of the need for cable replacements will be through critical load assessments and the increased inspection and maintenance program results.

Specific capital projects are expected to begin in FY29.

Pannell – Geneva 4-977 (C030889 - $10.9M)

The overhead line details:

- Total length: Approximately 25 miles
- Conductor: 795 ACSR “Coot” and 336.4 ACSR 30/7 “Oriole” (installed in 1922)
- Number of wood structure units: 8
- Number of steel structure units: 265 (including 1 steel pole)
- Types of structures: Predominantly the original 1906 Aeromotor towers
- Typical Installation date: Parts originally built in 1906 and operated at 66kv 25 cycle until upgraded to current 115kV 60 cycle in 1948. Circuits originally referred to as Mortimer-Geres Lock #3/Mortimer-Geneva #4.

This is a life extension project involving the targeted replacement of deteriorated structures, insulators, fittings, conductor and shield wire as well as tower painting and footer repairs. Conductor testing on the Mortimer-Pannell 25 line, which is the same vintage and conductor type as the Pannell-Geneva 4-977 lines which has had multiple conductor failures in recent years, shows significant loss of the zinc protective coating.

This project will replace structures and conductor at 14 road crossings to ensure public safety and reliability. The existing suspension structures will be replaced with direct embedded steel poles with guy wires. The conductor will be replaced across the road as well as all insulators and hardware.

Rotterdam - New Scotland 19 ACR (C084588 – $37.1M)

The overhead line details:

- Total length: 17.05 miles
- Conductor: 4/0 CU
- Total number of structures: 277
- Number of wood structure units: 82
- Number of steel structure units: 195
- Types of structures: Steel lattice, steel pole, and wood pole
- Typical Installation date: 1923

This project will address asset condition related issues on the 115kV Rotterdam - New Scotland #19 line (T5690) along with the Rotterdam - Altamont #17 (T5620) and the Altamont to New Scotland #20 (T5040) which run on the same double circuit towers as the #19 line. From the inspections preformed, the insulators on these lines show signs of deterioration/flashing, and the shieldwire is in a deteriorated state. Under this project all insulators will be replaced with toughened glass, the shieldwire will be replaced, and 7 structures will be replaced.

South Oswego-Clay #4 T-334 Rebuild (C075544 - $2.4M)

The overhead line details:

- Total length: 34.05 miles
- Conductor: 336.4 ACSR 26/7, 336.4 ACSR 18/1, and 795 ACSR 36/1
- Total number of structures: 382
- Number of wood structure units: 298
- Number of steel structure units: 84
- Types of structures: Steel square base lattice, steel channel flex, and wood H-frames
- Typical Installation date: Between 1914-1938

This circuit consists of essentially four segments:

South Oswego substation to T#62:
- On double circuit steel lattice towers with the South Oswego-Curtis St. #10
- These structures date back to the late 1930's early 1940's

Str. 63 to Str. 259:
- Single circuit wood H-frames. Original structures have bayonet for shield wire

T#260 to T#293:
- This segment of the circuit dates back to 1914 (T-411)
- On primarily double circuit steel lattice towers with the retired in place 69kV Bennett's Bridge-Geres Lock #6

Str. 294 to Str. 319 Clay substation:
- On single circuit wood H-frames

This project will be an ACR and replace deteriorated structures and insulators. The steel towers are in good condition and will be repainted to extend its serviceable life. After initial inspection, it was found that the majority of the conductor is in serviceable condition and will be monitored to ensure its condition meets its design requirements.

Spier-Queensbury #5 & #17 ACR (C060210, C060211 - $1.2M, $1.2M)

The overhead line details:

#5
- Conductor Types: 4/0 CU, 636 MCM ACSR
- Total number of structures: 119
- Total Steel: 32
- Total Wood: 87
- Types of structures: Steel lattice (30), Steel pole (2), Wood (87)
- Installation Date: The assets on the line date back to the early 1920s for the segment of the line on steel towers and the mid 1950's for the wood section.

#17
- Conductor Types: 4/0 CU, 636 MCM ACSR
- Total number of structures: 120
- Total Steel: 33
- Total Wood: 87
- Types of structures: Steel lattice (33), Wood (87)
- Installation Date: The assets on the line date back to the early 1920s for the segment of the line on steel towers and the mid 1950's for the wood section.

These projects will address the asset condition issues on the Spier - Queensbury #17 (T5740) and the Spier – Queensbury #5 (T5730) 115kv lines in Eastern NY. For the first 3.57 miles outside of Spier Falls, the #17 line is double circuited with the Spier – Queensbury #5 (T5730) on a combination of steel box towers and steel flex towers. The lines then split onto separate wood H-frame structures for the remaining 5.76 miles of the corridor and terminate at the Queensbury substation. Under these projects all insulators will be replaced with toughened glass and 48 wood structures will be replaced with wood pole equivalent steel.

SE Batavia – Golah 119 ACR (C060217 - $1.1M)

The overhead line details:

- Total length: 28.6 miles
- Conductor: (1) 795 ACSR conductor outside Batavia to N. LeRoy and (2) 397.5 ACSR to Golah
- Number of wood structure units: 323
- Number of steel structure units: 0

- Types of structures: H-frame
- Typical Installation date: 1925

This is a life extension project involving the targeted replacement of deteriorated structures, insulators, fittings, grounding, and shield wire. This project is nearing the end of conceptual engineering. As of now 39 structures will be replaced with steel.

Teall-Carr 6 Rebuild (C091985 - $11.0M)

The overhead line details:

- Total Length: 3.63 Miles
- Conductor Type: Primarily 636 ACSR, with a small section with 795 ACSR
- Number of Structures: 64 Structures
- Types of Structures: Primarily wood H-Frames with some sections of lines supported by lattice steel towers.
- Age: This line was constructed in 1957.

This MVT-AC project involves rebuilding and reconductoring the Teall – Carr 6, 115kV transmission line in its entirety to the latest National Grid standards and the NESC. This line was originally constructed in the early 1950's, and goes from the Teall Substation in Salina, NY to the Carr Substation in East Syracuse, NY, for a distance of 3.63 miles. This project will assure the safe, efficient, and reliable operation of the Transmission network and as well as serve its existing 6 large industrial customers. In addition, this project will allow for additional renewable energy to reach those customers in support of the State's clean energy goals.

Thompson-N Troy-Greenbush Corridor (C081667 - $13.8M)

The overhead line details:

- Total length: 23.13
- Conductor Types: 795 MCM ACSR, 605 MCM ACSR
- Number of structures: 184
- Total Steel: 180
- Total Wood: 4
- Types of structures: Steel Lattice (85), Steel Other (95), Wood (4)
- Lines:
    - T6550 Eastover Rd. to North Troy 307
    - T6540 Eastover Rd. to North Troy 306
    - T6820 Luther Forest – Eastover Rd 308
    - T7000 Schaghticoke – Luther Forest 3
    - T7020 Schaghticoke – Eastover 10
    - T6990 Mohican – Schaghticoke 309
    - T7010 Battenkill – Schaghticoke 310
    - Installation Date: 1923 to 1931

This will be 1 of 2 projects that address asset condition related issues on the 115kV corridor from Greenbush substation to Battenkill substation. These assets were installed under the original line from Thompson to Greenbush from 1923 to 1931. They have since been

segmented into individual lines as substations have been cut in over the years. This project will replace all insulators with toughened glass, replace 1.53 miles of shieldwire that failed testing and replace 33 structure.

Worst Performing Circuits (C084553 - $17.5M)

The worst performing circuit program specifically addresses the cause of the circuit being on the worst performing list. These are typically short turnaround projects that have the potential to improve the circuits' reliability. Projects typically include targeted re-insulating, grounding/bonding improvements, and potentially upgrading switches with remote control motor operated devices (RC-MOD's). These RC-MOD's would be operated remotely from the Transmission Control Center in Liverpool, NY. RC-MOD's avoid the need for a Traveling Operator to visit the field switch to operate it. The key driver of this project is step change improvement to both CAIDI and SAIFI. This program will improve both the short-term and long-term reliability of the system by focusing on the primary causes of transmission events.

Exhibit 6: Capital Project Deferral List

Exhibit 6 shows a list of capital projects greater than $500,000 that were actively considered but not included in the current year's budget during the annual budget build cycle.

Project Number	Project Description	Project Type	System	Spending Rationale	Division	FY25	FY26	FY27	FY28	FY29	Total
C050292	Bagdad-Dake Hill 815-34.5kV refurb	SubT Line	Sub-transmission	MVD	West	-	-	1,371	1,340	-	2,711
C050320	Union-Ausable Forks 36-46kV ref	SubT Line	Sub-transmission	Asset Condition	Central	-	1,589	97	-	-	1,686
C052444	Caledonia sub 44 - Line Relay Rep	Dist Sub	Sub-transmission	Asset Condition	West	-	-	-	-	-	-
C068247	Union Falls Flood Mitigation_SubT	SubT Line	Sub-transmission	Reliability	Central	-	1,229	29	-	-	1,258
C078428	Union Fall - Flood Mitigation -DSub	SubT Sub	Sub-transmission	System Capacity - NY	NYC	-	3,397	4,000	700	-	8,097
C082487	Boonville - Rebuild CH	Tran Sub LAB	Transmission	MVT	Central	-	2,479	1,859	1,859	-	6,198
C086816	Dunkirk-Falconer 160 Rebuild/CCR	Tran Line	Transmission	Reliability	West	-	50	210	12,950	-	13,210
C087290	Oneida - Substation Rebuild CH	Tran Sub LAB	Transmission	MVT	Central	-	1,899	-	-	-	1,899
C091773	New Krumkill/Ave A Line	Dist Line	Distribution	System Capacity - NY	East	-	270	1,073	1,500	-	2,843

Exhibit 7: Cost Sharing 2.0

National Grid considers utility-initiated upgrade opportunities, as defined in the Standardized Interconnection Requirements, in its planning processes. For CS2.0 Multi-Value Distribution projects: “In the course of its planning process, at the time when the utility identifies the need to install or replace a bank due to asset condition, reliability, safety, resiliency, or capacity requirements, the utility shall consider options for designing the new bank equipment to create greater DG/ESS Hosting Capacity than the baseline installation would create. If the bank can be upgraded to increase Hosting Capacity while solving a pre-existing asset condition, reliability, safety, resiliency, or capacity issue, and if there is market interest that indicates DG/ESS growth above the capacity of the baseline equipment, the utility will identify the enhanced installation or replacement in the next published CIP as a Multi-value Distribution (“MVD”) project. The utility will fund the cost of the baseline project. Participating Projects will fund the difference between the baseline and the MVD project cost.” The Company also considers proactive 3V0 opportunities to create additional hosting capacity.

CS2.0 MVD Candidacy Review
The initial review for projects with CS2.0 MVD potential takes place when the Company’s Distribution Planning groups conduct their annual capital needs assessment. During the Capital Investment Plan (“CIP”) development, the Company screens for potential CS2.0 MVD opportunities by reviewing substation transformer projects in the capital plan. Projects that can be feasibly upgraded from the baseline scope to a new scope that creates additional hosting capacity and are at a stage in the planning process that allows for scope changes, will be considered for CS2.0 MVD candidacy.

Projects Reviewed
In response to the “Order Approving Compliance Filings, with Clarifications” issued by the Commission in Case 20-E-0543, as of December 2023, the Company has developed 17 utility-driven Cost Sharing 2.0 projects.

The current list of projects being considered for utility-driven Cost Sharing 2.0 opportunities is provided in the table below. In 2023, the Company reviewed capital substation projects for Cost Sharing 2.0 opportunities. Many of the projects reviewed did not pass the scope or timing criteria. Though they were driven by asset condition issues or resiliency needs, the projects had need dates that were too immediate or there were not opportunities to install a larger substation transformer bank. The 2023 review identified a total of 17 new utility-driven Cost Sharing 2.0 opportunities.

The table below lists prospective utility-driven Cost Sharing 2.0 projects and their status:

Project Name	Project Type	Status	Voltage Type	Mechanism
Stittville	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Lake Colby	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Mill St	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Mumford	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Salisbury	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD

Debalso	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Chadwicks	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
New Royalton	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
New Middleport	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
North Shore	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
New Machias	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Delanson	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Buckley Corners	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Knapp Road	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Gilmantown	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Burdeck	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD
Franklinville	Asset Replacement	Preliminary Engineering	Distribution	CS2.0 MVD

Lessons Learned
National Grid will evolve its process to incorporate lessons learned and improve the MVD process. This is the second year of the MVD process implementation, with lessons learned to follow in subsequent CIPs.

Market-Initiated Upgrades
In addition to the Utility-Initiated Upgrades, the Cost Sharing 2.0 Order also provides mechanisms for cost sharing for Market-Initiated Upgrades, including substation transformer projects, other substation projects, and shared line upgrades. Market-Initiated substation upgrades set thresholds of upgrade costs to be collected from participating projects to trigger utility work. Utilities continue to collect from additional participating projects until the full cost of the upgrade is collected. Unrecovered costs are capped at 2% of the utility's Distribution/Sub-Transmission capital plan based on a five-year forward-looking average. The Company's FY25 cap will be $21,389,000.

Conclusion
The Company anticipates that Cost Sharing 2.0. experience will drive continuous improvement to incorporate lessons learned and industry best practices. The Company will continue to evaluate projects to identify potential Multi-Value Distribution projects for 2024 and beyond. The Company will also continue to work in conjunction with the Joint Utilities ("JU") to incorporate lessons learned from the JU group, as appropriate. Additionally, the Company will continue to process and develop market-driven projects in accordance with the SIR.

Exhibit 8: New York Transmission Assumed Net Zero Reimbursable Projects

Exhibit 8 shows a list of NY Transmission Capital reimbursable projects with an assumed net zero impact to the financial five year plan. These projects are not included in Exhibits 1-3, or the narratives provided in the above chapters.

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
C083667	SUNY Poly 115kV LN6 Tap	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	2,100	-	-	-	-
C083667R	SUNY Poly 115kV LN6 Tap Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(2,100)	-	-	-	-
C087738	Tayandenega Solar T-Line	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	1,900	-	-	-	-
C087738R	Tayandenega Solar T-Line Reimb	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(1,900)	-	-	-	-
C088950	High River Solar T-Line	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	465	-	-	-	-
C088950R	High River Solar T-Line Reimb	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(465)	-	-	-	-
C083615	Alle Catt II Wind - Stations	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	321	1,119	836	-	-
C083615R	Alle Catt II Wind - Stations Reimb	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	(321)	(1,119)	(836)	-	-
C087739	Tayandenega Solar - Stations	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	911	-	-	-	-
C087739R	Tayandenega Solar - Stations Reimb	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(911)	-	-	-	-
C088948	High River Solar - Stations	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	159	-	-	-	-
C088948R	High River Solar - Stations Reimb	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(159)	-	-	-	-
C093883	Heritage Wind Project Stations	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	1,208	1,208	-	-	-
C093883R	Heritage Wind Project Stations Reimb	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	(1,208)	(1,208)	-	-	-
C093885	Heritage Wind Project Line	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	1,285	1,286	-	-	-
C093885R	Heritage Wind Project Line Reimb	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	(1,285)	(1,286)	-	-	-
CNYCS20	Homer Solar Energy Center Storage Stations	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	1,284	1,283	-	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CNYCS20R	Homer Solar Energy Center Storage Stations Reimb	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	(1,284)	(1,283)	-	-	-
CNYCS21	Homer Solar Energy Center Line	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	1,929	1,930	-	-	-
CNYCS21R	Homer Solar Energy Center Line Reimb	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	(1,929)	(1,930)	-	-	-
CNYCS26	Rock District Solar Project Stations	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	630	458	-	-	-
CNYCS26R	Rock District Solar Project Stations Reimb	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(630)	(458)	-	-	-
CNYCS27	Rock District Solar Project Line	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	1,050	744	-	-	-
CNYCS27R	Rock District Solar Project Line Reimb	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(1,050)	(744)	-	-	-
CNYCS48	Martin Road Solar Project Stations	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	470	469	-	-	-
CNYCS48R	Martin Road Solar Project Stations Reimb	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	(470)	(469)	-	-	-
CNYCS49	Martin Road Solar Project Line	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	1,398	1,397	-	-	-
CNYCS49R	Martin Road Solar Project Line Reimb	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	(1,398)	(1,397)	-	-	-
CNYCS74	ELP Ticonderoga Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	694	187	-	-	-
CNYCS74R	ELP Ticonderoga Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(694)	(187)	-	-	-
CNYCS75	ELP Ticonderoga Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	2,140	527	-	-	-
CNYCS75R	ELP Ticonderoga Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(2,140)	(527)	-	-	-
CNYCS78	Hilltop Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	587	147	-	-	-
CNYCS78R	Hilltop Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(587)	(147)	-	-	-
CNYCS79	Hilltop Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	1,256	838	-	-	-
CNYCS79R	Hilltop Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(1,256)	(838)	-	-	-
CNYCS80	Dolan Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	684	171	-	-	-
CNYCS80R	Dolan Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(684)	(171)	-	-	-
CNYCS81	Dolan Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	1,706	427	-	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CNYCS81R	Dolan Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(1,706)	(427)	-	-	-
CNYCS82	Fairway Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	501	626	125	-	-
CNYCS82R	Fairway Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(501)	(626)	(125)	-	-
CNYCS83	Fairway Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	1,367	1,094	273	-	-
CNYCS83R	Fairway Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(1,367)	(1,094)	(273)	-	-
CNYCS84	NY13 Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	634	634	-	-	-
CNYCS84R	NY13 Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(634)	(634)	-	-	-
CNYCS85	NY13 Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	1,101	1,101	-	-	-
CNYCS85R	NY13 Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(1,101)	(1,101)	-	-	-
CSS0005	Tracy Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	400	5,613	591	-	-
CSS0005R	Tracy Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(400)	(5,613)	(591)	-	-
CSS0006	Tracy Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	600	1,119	315	-	-
CSS0006R	Tracy Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(600)	(1,119)	(315)	-	-
CSS0007	South Ripley Solar Project Stations	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	543	1,266	-	-	-
CSS0007R	South Ripley Solar Project Stations Reimb	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	(543)	(1,266)	-	-	-
CSS0008	Oxbow Solar Project Stations	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	1,477	1,000	-	-	-
CSS0008R	Oxbow Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	(1,477)	(1,000)	-	-	-
CSS0009	NY38 Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	2,322	2,322	-	-	-
CSS0009R	NY38 Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(2,322)	(2,322)	-	-	-
CSS0010	NY38 Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	1,451	1,451	-	-	-
CSS0010R	NY38 Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(1,451)	(1,451)	-	-	-
CSS0011	Pirates Island Solar Project Stations	Tran Sub	Substation - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	509	5,089	4,072	508	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0011R	Pirates Island Solar Project Stations Reimb	Tran Sub	Substation - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	(509)	(5,089)	(4,072)	(508)	-
CSS0012	Pirates Island Solar Project Line	Tran Line	Transmission - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	53	530	424	53	-
CSS0012R	Pirates Island Solar Project Line Reimb	Tran Line	Transmission - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	(53)	(530)	(424)	(53)	-
CSS0015	Riverside Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	661	5,613	330	-	-
CSS0015R	Riverside Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(661)	(5,613)	(330)	-	-
CSS0016	Riverside Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	151	1,280	75	-	-
CSS0016R	Riverside Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(151)	(1,280)	(75)	-	-
CSS0017	Grassy Knoll Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	781	782	-	-	-
CSS0017R	Grassy Knoll Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(781)	(782)	-	-	-
CSS0018	Grassy Knoll Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	1,717	1,717	-	-	-
CSS0018R	Grassy Knoll Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(1,717)	(1,717)	-	-	-
CSS0021	Orleans Solar Project Stations	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	319	959	320	-	-
CSS0021R	Orleans Solar Project Stations Reimb	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	(319)	(959)	(320)	-	-
CSS0022	Orleans Solar Project Line	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	463	3,243	927	-	-
CSS0022R	Orleans Solar Project Line Reimb	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	(463)	(3,243)	(927)	-	-
CSS0023	Sugar Maple Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	253	2,152	126	-	-
CSS0023R	Sugar Maple Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(253)	(2,152)	(126)	-	-
CSS0024	Sugar Maple Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	603	5,122	301	-	-
CSS0024R	Sugar Maple Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(603)	(5,122)	(301)	-	-
CSS0027	Alabama Solar Project Stations	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	591	5,906	4,725	590	-
CSS0027R	Alabama Solar Project Stations Reimb	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	(591)	(5,906)	(4,725)	(590)	-
CSS0028	Alabama Solar Project Line	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	80	795	637	80	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0028R	Alabama Solar Project Line Reimb	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	(80)	(795)	(637)	(80)	-
CSS0029	Levy Grid BESS Project Stations	Tran Sub	Substation - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	324	973	324	-	-
CSS0029R	Levy Grid BESS Project Stations Reimb	Tran Sub	Substation - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	(324)	(973)	(324)	-	-
CSS0030	Levy Grid BESS Project Line	Tran Line	Transmission - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	473	1,183	710	-	-
CSS0030R	Levy Grid BESS Project Line Reimb	Tran Line	Transmission - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	(473)	(1,183)	(710)	-	-
CSS0033	NY37 Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	2,300	2,300	-	-	-
CSS0033R	NY37 Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(2,300)	(2,300)	-	-	-
CSS0034	NY37 Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	1,017	1,017	-	-	-
CSS0034R	NY37 Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(1,017)	(1,017)	-	-	-
CSS0035	SE Manchester Solar Project Stations	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	45	800	845	-	-
CSS0035R	SE Manchester Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	(45)	(800)	(845)	-	-
CSS0036	SE Manchester Solar Project Line	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	50	950	1,000	-	-
CSS0036R	SE Manchester Solar Project Line Reimb	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	(50)	(950)	(1,000)	-	-
CSS0037	SE Flat Stone Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	50	400	4,500	-	-
CSS0037R	SE Flat Stone Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(50)	(400)	(4,500)	-	-
CSS0038	SE Flat Stone Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	50	800	850	-	-
CSS0038R	SE Flat Stone Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(50)	(800)	(850)	-	-
CSS0039	Somers Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	700	700	-	-	-
CSS0039R	Somers Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(700)	(700)	-	-	-
CSS0040	Somers Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	850	850	-	-	-
CSS0040R	Somers Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(850)	(850)	-	-	-
CSS0041	Millers Grove Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	475	475	-	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0041R	Millers Grove Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(475)	(475)	-	-	-
CSS0042	Millers Grove Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	850	850	-	-	-
CSS0042R	Millers Grove Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	(850)	(850)	-	-	-
CSS0045	South Ripley Solar Project Line	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	558	1,302	-	-	-
CSS0045R	South Ripley Solar Project Line Reimb	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	(558)	(1,302)	-	-	-
CSS0046	Deer River Wind Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	1,693	1,692	-	-
CSS0046R	Deer River Wind Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(1,693)	(1,692)	-	-
CSS0047	Deer River Wind Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	417	417	-	-
CSS0047R	Deer River Wind Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(417)	(417)	-	-
CSS0048	Limestone Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	50	1,000	1,150	-	-
CSS0048R	Limestone Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(50)	(1,000)	(1,150)	-	-
CSS0049	Limestone Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	50	1,000	1,050	-	-
CSS0049R	Limestone Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(50)	(1,000)	(1,050)	-	-
CSS0050	Tabletop Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	50	1,000	2,950	-	-
CSS0050R	Tabletop Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(50)	(1,000)	(2,950)	-	-
CSS0051	Tabletop Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	50	1,000	1,050	-	-
CSS0051R	Tabletop Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(50)	(1,000)	(1,050)	-	-
CSS0052	Niagara Grid I BESS Project Stations	Tran Sub	Substation - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	300	300	-	-	-
CSS0052R	Niagara Grid I BESS Project Stations Reimb	Tran Sub	Substation - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	(300)	(300)	-	-	-
CSS0053	Niagara Grid I BESS Project Line	Tran Line	Transmission - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	500	1,200	-	-	-
CSS0053R	Niagara Grid I BESS Project Line Reimb	Tran Line	Transmission - NY West	Frontier	Customer Request/Public Requirement	Customer Interconnections	(500)	(1,200)	-	-	-
CSS0054	Cobleskill Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	200	260	-	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0054R	Cobleskill Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(200)	(260)	-	-	-
CSS0055	Cobleskill Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	500	1,500	-	-	-
CSS0055R	Cobleskill Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(500)	(1,500)	-	-	-
CSS0056	Warner Hill Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	50	900	800	-	-
CSS0056R	Warner Hill Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(50)	(900)	(800)	-	-
CSS0057	Warner Hill Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	50	1,950	2,000	-	-
CSS0057R	Warner Hill Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(50)	(1,950)	(2,000)	-	-
CSS0058	Marshville Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	500	2,700	-	-	-
CSS0058R	Marshville Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(500)	(2,700)	-	-	-
CSS0059	Marshville Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	100	400	-	-	-
CSS0059R	Marshville Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	(100)	(400)	-	-	-
CSS0060	Mill Point Solar Project Stations	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	100	1,000	1,400	-	-
CSS0060R	Mill Point Solar Project Stations Reimb	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(100)	(1,000)	(1,400)	-	-
CSS0061	Mill Point Solar Project Line	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	100	1,500	1,400	-	-
CSS0061R	Mill Point Solar Project Line Reimb	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(100)	(1,500)	(1,400)	-	-
CSS0062	Rotterdam Solar Project Stations	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	100	1,000	2,400	-	-
CSS0062R	Rotterdam Solar Project Stations Reimb	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(100)	(1,000)	(2,400)	-	-
CSS0063	Rotterdam Solar Project Line	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	100	500	900	-	-
CSS0063R	Rotterdam Solar Project Line Reimb	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	(100)	(500)	(900)	-	-
CSS0064	Morris Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	50	200	550	-	-
CSS0064R	Morris Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(50)	(200)	(550)	-	-
CSS0065	Morris Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	50	450	1,000	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0065R	Morris Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	(50)	(450)	(1,000)	-	-
CSS0066	Fort Edward Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,100	-	-
CSS0066R	Fort Edward Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,100)	-	-
CSS0067	Fort Edward Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0067R	Fort Edward Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0068	Transit Solar Project Stations	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	-	500	1,200	-	-
CSS0068R	Transit Solar Project Stations Reimb	Tran Sub	Substation - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	-	(500)	(1,200)	-	-
CSS0069	Transit Solar Project Line	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	-	500	1,000	-	-
CSS0069R	Transit Solar Project Line Reimb	Tran Line	Transmission - NY West	Genesee	Customer Request/Public Requirement	Customer Interconnections	-	(500)	(1,000)	-	-
CSS0070	Jaton Solar Project Stations	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	500	1,200	-	-
CSS0070R	Jaton Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	(500)	(1,200)	-	-
CSS0071	Jaton Solar Project Line	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	500	1,000	-	-
CSS0071R	Jaton Solar Project Line Reimb	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	(500)	(1,000)	-	-
CSS0072	Teele Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	500	500	-	-
CSS0072R	Teele Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(500)	(500)	-	-
CSS0073	Teele Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	800	900	-	-
CSS0073R	Teele Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(800)	(900)	-	-
CSS0074	Rutland Center Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	1,900	1,900	-	-
CSS0074R	Rutland Center Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(1,900)	(1,900)	-	-
CSS0075	Rutland Center Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	800	900	-	-
CSS0075R	Rutland Center Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(800)	(900)	-	-
CSS0076	Kingbird Solar Project Stations	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	340	340	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0076R	Kingbird Solar Project Stations Reimb	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	(340)	(340)	-	-
CSS0077	Kingbird Solar Project Line	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0077R	Kingbird Solar Project Line Reimb	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0078	Thousand Islands Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	3,000	3,570	-	-
CSS0078R	Thousand Islands Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(3,000)	(3,570)	-	-
CSS0079	Thousand Islands Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0079R	Thousand Islands Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0080	Hoffman Falls Solar Project Stations	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,030	-	-
CSS0080R	Hoffman Falls Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,030)	-	-
CSS0081	Hoffman Falls Solar Project Line	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0081R	Hoffman Falls Solar Project Line Reimb	Tran Line	Transmission - NY Central	Syracuse Oswego Cortland	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0082	Honey Ridge Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,100	1,100	-	-
CSS0082R	Honey Ridge Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,100)	(1,100)	-	-
CSS0083	Honey Ridge Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,100	-	-
CSS0083R	Honey Ridge Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,100)	-	-
CSS0084	Twinleaf Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,100	1,150	-	-
CSS0084R	Twinleaf Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,100)	(1,150)	-	-
CSS0085	Twinleaf Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	920	920	-	-
CSS0085R	Twinleaf Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(920)	(920)	-	-
CSS0086	Moss Ridge Solar Project Stations	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	930	930	-	-
CSS0086R	Moss Ridge Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(930)	(930)	-	-
CSS0087	Moss Ridge Solar Project Line	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0087R	Moss Ridge Solar Project Line Reimb	Tran Line	Transmission - NY Central	Northern	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0088	York Run Solar Project Stations	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	850	850	-	-
CSS0088R	York Run Solar Project Stations Reimb	Tran Sub	Substation - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	(850)	(850)	-	-
CSS0089	York Run Solar Project Line	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0089R	York Run Solar Project Line Reimb	Tran Line	Transmission - NY West	Southwest	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0090	NY48-Diamond Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,050	-	-
CSS0090R	NY48-Diamond Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,050)	-	-
CSS0091	NY48-Diamond Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0091R	NY48-Diamond Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0092	NY115-Newport Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	410	410	-	-
CSS0092R	NY115-Newport Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(410)	(410)	-	-
CSS0093	NY115-Newport Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	800	900	-	-
CSS0093R	NY115-Newport Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(800)	(900)	-	-
CSS0094	NY128-Foothills Solar Project Stations	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	-	880	890	-	-
CSS0094R	NY128-Foothills Solar Project Stations Reimb	Tran Sub	Substation - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	-	(880)	(890)	-	-
CSS0095	NY128-Foothills Solar Project Line	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0095R	NY128-Foothills Solar Project Line Reimb	Tran Line	Transmission - NY East	Capital Hudson Valley	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0096	North Seneca Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	880	890	-	-
CSS0096R	North Seneca Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(880)	(890)	-	-
CSS0097	North Seneca Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0097R	North Seneca Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0098	Crane Brook Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	645	645	-	-

Project Number	Project Description	Project Type	Division	Region	Spending Rationale	Capex Program Name	FY25	FY26	FY27	FY28	FY29
CSS0098R	Crane Brook Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(645)	(645)	-	-
CSS0099	Crane Brook Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0099R	Crane Brook Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0100	Scotch Ridge Solar Project Stations	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	605	605	-	-
CSS0100R	Scotch Ridge Solar Project Stations Reimb	Tran Sub	Substation - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	(605)	(605)	-	-
CSS0101	Scotch Ridge Solar Project Line	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	1,000	1,000	-	-
CSS0101R	Scotch Ridge Solar Project Line Reimb	Tran Line	Transmission - NY East	Northeast	Customer Request/Public Requirement	Customer Interconnections	-	(1,000)	(1,000)	-	-
CSS0102	Gravel Road Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	1,330	1,330	-	-
CSS0102R	Gravel Road Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(1,330)	(1,330)	-	-
CSS0103	Gravel Road Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	2,000	2,000	-	-
CSS0103R	Gravel Road Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(2,000)	(2,000)	-	-
CSS0104	ELP Granby II Solar Project Stations	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	340	340	-	-
CSS0104R	ELP Granby II Solar Project Stations Reimb	Tran Sub	Substation - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(340)	(340)	-	-
CSS0105	ELP Granby II Solar Project Line	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	900	1,000	-	-
CSS0105R	ELP Granby II Solar Project Line Reimb	Tran Line	Transmission - NY Central	Utica Rome	Customer Request/Public Requirement	Customer Interconnections	-	(900)	(1,000)	-	-