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March 31, 2020

VIA ELECTRONIC MAIL

Honorable Michelle Phillips, Secretary New York State Public Service Commission Three Empire State Plaza Albany, NY 12223-1350

> Re: Case 07-M-0906 - New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation – Compliance Filing – Five-Year Capital Expenditure Forecasts

Dear Secretary Phillips:

Pursuant to Appendix 2, Paragraph 2(d) of the New York State Public Service Commission's Order Authorizing Acquisition Subject to Conditions in Case 07-M-0906, New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E") (together the "Companies") hereby file a Five Year Capital Investment Plan ("Plan") that contains five-year forecasts (2020 - 2024) of their currently planned electric and gas system capital investments. These investments will support continued provision of safe and reliable service.

The Companies welcome the opportunity for dialogue with Staff on the contents of this Plan.

If you have any questions concerning this filing, please contact Chris Herrmann at (585) 771-2294.

Respectfully submitted,

Joseph J. Syta





INVESTMENT PLANNING / AVANGRID March 31, 2020

NYSEG and RG&E Five Year Capital Investment Plan 2020-2024





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Chapter 1 Introduction

The purpose of this document is to present a comprehensive five year Capital Investment Plan for the electric transmission and distribution, generation, and natural gas businesses of AVANGRID Networks' New York operating companies ("Companies"), New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E"), for the period 2020 through 2024.

The Companies are filing this document recognizing that the pandemic situation associated with COVID-19 could have an impact on the capital projects presented here.

The content of this document is organized as follows:

<u>Chapter 1</u> provides an introduction to the document and content.

Chapter 2 offers an Executive Summary of the contents of this document.

<u>Chapter 3</u> provides an overview of the redesigned Planning and Approval Processes including strategic objectives of the Companies. Also included in this chapter is a brief investment summary of electric and gas for each of the Companies.

<u>Chapter 4</u> provides and describes the Electric and Generation Capital Investment Forecast required to meet the Companies' strategic objectives.





The forecast has been grouped into categories which describe the main drivers for the investments presented.

<u>Chapter 5</u> describes the Natural Gas Capital Investment Forecast required to meet the Companies' strategic objectives. Likewise, the plan has been grouped into categories which describe the main drivers for the investments.

<u>Chapter 6</u> outlines the Common Capital Investment Forecast to meet the strategic objectives of the Companies. These projects and programs support more than one of the businesses and are categorized, as well, by main area driving the investment.

<u>Chapter 7</u> presents information on the anticipated Bulk Electric System ("BES") corrective action plan upgrades included in the capital plan.

<u>Chapter 8</u> provides information on the projects in the capital investment plan related to New York State's Reforming the Energy Vision ("REV") program. This provides a general description, scope, and justification of projects supporting this program.

<u>Chapter 9</u> describes the AMI program description, scope and supporting justification information.

<u>Chapter 10</u> provides information on the Electric System Resiliency Plan which identifies actions to reduce the number of customers that experience





outages during major outage events and enable the Companies to restore power more quickly to impacted customers.

<u>Chapter 11</u> describes the Non-Wires Alternative program scope, benefits and justification.

The Appendices which follows includes a summary of the Capital Investment Forecast for each of the Companies, project lists and expenditures, and descriptive project summaries, by Company, for electric projects with forecasts greater than \$5 million, gas projects greater than \$1 million, and common projects greater than \$500 thousand.

Chapter 2 Executive Summary

This document presents a comprehensive five-year Capital Investment Plan for the electric transmission, distribution, generation, and natural gas businesses of AVANGRID Networks' New York operating companies, New York State Electric & Gas Corporation ("NYSEG") and Rochester Gas and Electric Corporation ("RG&E"), for the period 2020 through 2024 (the "Plan"). This Plan positions NYSEG and RG&E (the "Companies") to continue to provide safe and reliable service to customers. The Companies plan to invest \$4.3 billion in the electric delivery and generation systems and \$950.1 million in the gas delivery system over the five-year period 2020-2024.





To meet the needs of customers, improve reliability, strengthen the system against the adverse effects of major storms, and achieve long-term business objectives, the Companies uses a capital investment planning and approval process that assesses the system needs and introduces projects and programs to address those needs in relation to the strategic objectives of the Companies. The result is a comprehensive capital investment plan that includes projects and programs related to customer connections, capacity, asset condition replacement, reliability improvements, resiliency, system operations and modernization. In addition, the Companies also review the capital investments needed to support these functions such as information technology, fleet, facilities, security, operational technology and other common.

The Plan is categorized by group into the projects and programs into the main driver of the investment as follows:

Customer: This category groups projects related to customer obligations which generally includes new connections/installations, state and municipal relocations, and meters.

Capacity (electric only): This category presents projects aimed at addressing system capacity issues related to growth, either localized or system-wide. Projects include construction of new substations and substation upgrades, area reinforcements, transmission upgrades, and the like.

Asset Condition, Reliability and Resiliency (resiliency is electric only): Projects in this category are focused on fulfilling the core objective of providing reliable electric/gas service and repairing or preventing damage to





the respective system caused by failure of equipment due to end of useful life and poor asset condition. This group includes for Electric: asset condition replacement projects, reliability improvement projects, and the comprehensive resiliency plan. For Gas, this group includes the Leak Prone Main Replacement program, regulator and gate station improvements, distribution and transmission main replacement projects, pressure reliability projects, and other asset condition projects.

System Operations (electric only): The system operations category groups general operations equipment and capital expenditures associated with storm restoration.

Compliance (electric only): This category represents electric compliance projects resulting from mandates, orders, or other regulatory or governmental direction. The BES program and other NERC mandated projects are included in this category.

Modernization includes projects related to business efficiency and system automation. This category includes the Advanced Metering Infrastructure ("AMI") and New York Distributed System Implementation Plan ("DSIP") projects as well as the Energy Smart Community ("ESC") program. DSIP is an electric only program.

The categorizations of Generation and Common expenditures group certain projects and programs into the main drivers of the investments. Generation projects and programs have been grouped into Asset Condition, Capacity, and System Operations. The Generation Asset Condition category provides the capital





requirements to replace obsolete and aged infrastructure, the Generation Capacity category addresses other generating station updates, and the Generation System Operations category is aimed at minor capital expenditures to maintain these assets. The Common expenditures are grouped into Information Technology, Fleet, Facilities, Security, Operational Technology, and Other.

The proposed capital expenditures in this plan will allow the Companies to meet its business objectives, including the provision to its customers of safe, reliable service while meeting future system needs and improving reliability.

Chapter 3 Capital Investment Planning Process Overview

The process for planning and executing the Companies' capital investments is critical to the overall success of the Plan. It is a rigorous approach that addresses selection, prioritization, approval, execution, and control of capital portfolio of projects and programs. The Plan is refreshed annually by reviewing and updating the projects and programs, aligning functional needs, and synchronizing resources, costs and schedules.

Section 1 Planning Process

The following is a description of the annual capital investment planning process for NYSEG and RG&E. Details of each of the Company's investment forecasts are included in the chapters following this one.

Planning Objectives:

In identifying projects included in a capital investment plan, each Company considers the following strategic objectives:





- Maintaining safety and security;
- Meeting customers' electric and gas needs;
- Achieving service reliability and quality targets;
- Replacing assets and facilities based on condition and obsolescence;
- Improving the network's effectiveness and efficiency;
- Sustaining the environment.

During the planning process, each Company selects projects aimed at achieving one or more of these objectives in a cost-effective manner.

Contributors:

The contributors to the plan include both operational business areas as well as those areas that support the operation of the business. Each group is responsible for a sector of the business and coordination and communication occurs between each as the system needs are assessed and the investment plan is developed and refined. The business and support areas that contribute to each Company plan are as follows:

Operational Business Areas: Asset Management and Planning, Customer Service, Electric Operations, Gas Operations, Generation, Process & Technology, Projects, and Smart Grids.

Support Business Areas: General Services and Fleet, Information Technology, and Security.

Plan Overview:

The investment plan is developed to meet the needs of customers, improve reliability, strengthen the system against the adverse effects of major storms, and achieve the





long-term business objectives of the Company. The projects and programs proposed in the plan are those that have currently been determined to be necessary to deliver safe and reliable service to customers. The Companies continually re-evaluate and reprioritize projects and review the system needs due to the continually changing environment in which the Companies operate. Therefore, at any single point in time, the plan is a current picture of the projects and system needs which will likely change as a result of ongoing re-evaluation and reprioritization processes. Many of the electric projects reduce the risk of service outages in the event of contingency situations while other projects address mandates issued by state and federal regulators, and we expect that new regulations will be forthcoming during the term of this Plan. In addition, there are several projects that continue the process of bringing the electric delivery system up to present day standards by modernizing equipment, employing software and IT platforms and expanding system automation. These standards are under regular review. The gas projects are generally focused on safety and reliability while addressing mandates issued by state and federal regulators, including compliance with rate case requirements. The gas projects, likewise, include modernization and update of equipment at gate and regulator stations, as well as improvements to meet current Company construction standards.

The phases of the planning process are described below. While the plan phases are defined, the process is fluid and the reiteration through the phases occurs many times throughout the year as new factors are introduced and other factors change such as regulatory requirements, customer needs and system conditions.

Phases of the Planning Process:





Phase I. Initiation and Planning

During this initial phase, the business areas focus on the Companies' strategic objectives and the needs of each Company to effectively and efficiently meet those objectives. A description of each of those objectives is as follows:

Objective 1: Maintain and improve system safety

Safety is each Company's number one priority and each Company accordingly places significant emphasis on the safety of its employees and the public. The Companies operate a "no harm" culture and will continue to make investments in order to assure the safe and reliable operation of the system.

No aspect of the Companies'operations is more important than accident prevention. Safety is a value that does not change. There is no job so important that established safety rules are ever compromised. Management strives to provide a hazard-free work environment that complies with all applicable health and safety laws and regulations, and educates employees, customers and the public about health and safety hazards associated with our operations. Further, management is committed to the recognition, assessment, and control of health and safety hazards related to each of the Company's facilities and operations.

In order to keep the Companies' employees safe, to help ensure the integrity of the Companies' systems and provide reliable service to customers, each Company continues to upgrade the physical security at and around the NYSEG and RG&E facilities as well as the overall cyber security infrastructure. These upgrades include improved access control, video surveillance and alarming capabilities. More stringent NERC standards require the Companies to improve





and expand its security capabilities to protect critical electric system infrastructure. Further, the challenges that each Company faces to ensure data protection, privacy and ensuring compliance with regulatory and legal mandates continue to grow as threats evolve and grow increasingly more sophisticated.

Objective 2: Meet the electric and gas needs of our customers Each Company needs to provide reliable and dependable electric and gas service to large commercial and industrial customers as well as residential customers. Often large commercial and industrial customers require an upgrade to a Company's electric or gas facilities to meet their needs, and the Companies strive to make these upgrades in a timely manner. In certain cases all or a portion of the costs of these upgrades may be offset by contributions from the specifically affected customers. Additionally, with the increased proliferation of distributed energy resources (DER) on the electric system, the Companies must interconnect large and small generation projects to its transmission and distribution system, as requested by customers and in accordance with applicable regulatory requirements.

Objective 3: Achieve service reliability and quality targets The Electric Plan supports this strategic objective by the following actions:

- Prevent or minimize overloads on lines and transformers under normal operating conditions at peak demand;
- Prevent or minimize contingency situations (N-1) and (N-1-1); and
- Enhance operation and restoration of the system through replacement and modernization of end-of-life equipment.





The Gas Plan supports this objective by the following actions:

- Improve operations and reliability of gate and regulator stations by replacing obsolete or undersized equipment and rebuilding stations to meet current Company construction standards; and
- Improve operating pressures in consideration of gas load demands.

Objective 4: Replace assets and facilities based on condition and obsolescence Each Company continuously reviews equipment and facilities to determine which assets may be in need of replacement. Typically, those assets are identified due to one of the following conditions:

- Equipment and facilities with high failure rates,
- Technological obsolescence (e.g. inability to obtain spare parts),
- Facilities that are in poor condition and the maintenance of such equipment is no longer cost effective;
- Equipment with high maintenance costs for reasons other than poor condition;
- Risk of not meeting safety, reliability, and environmental objectives; and
- Other indicators of asset health

Objective 5: Improve effectiveness and efficiency through modernization Each Company continually looks for ways to make operations more effective and efficient. One of those ways is through network automation. The Companies continue to modernize the operations of its systems, enhancing the effectiveness





with which NYSEG and RG&E serves customers, and also enhancing reliability and efficiency.

On the electric system, the primary customer benefit of automation is more efficient and effective response to distribution circuit outages. The crews restoring service will receive notification of an outage sooner than they would without an automated system of notification. Adding reclosers on distribution lines reduces the potential number of customers whose service is impacted during an outage and reclosers will quickly relay the location of an outage to the Companies' energy control centers. Additionally, the Companies project an increase in crew efficiency due to the reduction of travel time to assess an outage Investment in automation will also be compatible with technologies required for the development of a smart grid.

Natural gas gate and regulator station modernization will improve crew efficiency by reducing time required for crews to assess and address operational issues.

Objective 6: Sustain the environment

Each Company complies with all environmental laws and regulations in carrying out its electric and gas delivery services. The Companies make decisions to deliver positive long term environmental results. Operating in an ethical manner and demonstrating a respect for the environment are pillars of the business.

Phase II. Data Gathering and Analysis





Given the objectives of the Companies, the business areas analyze data to determine whether the objectives are being met. The data is collected and provided through a number of different methods such as asset condition health assessments, inspection programs, failed equipment information, and asset replacement practices.

The business areas determine the data that needs to be collected and reviewed to assess the system needs. For instance, fleet replacement is determined by application of the established fleet replacement procedure which contains specific criteria for replacement including age, maintenance, and condition. With electric and gas equipment, there are many factors which contribute to the inclusion of projects in the plan, including customer and capacity needs, the overall obligation to serve, reliability indices, asset health, system hardening needs, adherence to operating standards, and support of normal operations.

New projects are initiated and current projects may be adjusted based on the information that has been collected and analyzed.

Phase III. Individual Budget and Plan Development

Upon the completion of the analysis and data gathering efforts, the business areas then develop and/or modify the individual project forecasts. These individual project forecasts comprise a business area's forecast which in turn becomes a component of the Companies total capital plan. Business area plans can and do change based on a variety of factors, including system conditions, customer needs and regulatory requirements. These conditions are reviewed and addressed by the business areas.





Phase IV. Plan Review and Alignment

Utilizing the information and budget data from each area's individual plans, the Companies capital investment plan is compiled. The plan is reviewed for alignment across the business areas and may be adjusted during the review process.

Section 2 Capital Investment Planning and Approval Process

The Companies' have redesigned the Planning and Investment Approval Process to increase performance, predictability and alignment with the Companies' planning objectives as described above. The redesigned process includes Governance oversight, and project review and approval stage gates with an overall increased focus on project justification, review and prioritization.

Governance:

Depending on the value, complexity and nature of the investment, proposed projects and previously identified projects are reviewed by one or more of the following governance review groups through the approval process.

- System Review Group (SRG) this group reviews the technical and engineering aspects of certain electric system investments.
- Electric Strategic Planning and Gas Strategic Planning Group (ESP/GSP) this group provides for the review the regulatory and financial aspects of a project in relation to the current portfolio. This group reviews projects across all electric, gas, and common business areas and for new and existing projects original approval and changes.





 Investment Review Group (IRG) – this group is comprised of executives and provides them the opportunity to review investments to move forward as suggested.

Stages of Investment Approval Process:

The approval process consists of a staged approach. This staged approach to investment approval where investments are approved at distinct points (gates) throughout the process provides for:

- separate concept and technical/engineering approval stages that ensure only those projects that have viable solutions have resources allocated to develop full technical specifications
- separate governance reviews and approvals for financial/execution before expending funds
- re-approval of investments while not necessary for all projects does allow for govenance teams to challenge the underlaying reasons for those that do propose a change to the scope, schedule or cost of a project. This also has the advantage in that it tends to draw out lessons learned for application to future projects.

The five stage gates are as follows:

1. Conceptual Approval (IP1)

An IP1 is required to initiate a new project/program for its inclusion into the capital investment plan. All projects not currently in the capital investment plan begin with this phase. IP1s are presented to appropriate governance





groups for approval or further action based on level and complexity of the projects.

2. Technical/Engineering Approval (IP2)

The approval is facilitated by the SRG governance group to review the need and technical aspects of certain electric projects including proposed solution design, alternatives considered, capital expenditure levels, project timeline, environmental concerns, and other pertinent information deemed necessary. This approval phase is currently being piloted in the electric companies only.

3. Financial/Execution Approval (IP3)

This stage represents the approval to expend funds on the execution of the project. For those projects requiring IP2 approval, this stage follows that approval. This is done by submitting an IP3 for review and approval. They are presented to appropriate governance groups for approval or further action based on level and complexity of the projects and then flows through the required grants of signing authority. Discussions at governance groups include level of the budget, regulatory position, alternative options, project risks, and other project details.

4. Change Approval (IP4)

An IP4 is required for all project changes that fall outside allowed project tolerence paramaters. Project changes are presented to the governance review groups based on the complexity and level of the investment. The discussions include reason for the change to scope, schedule and/or cost, nature of the expenditure, impact on current budget/forecast/plan, and regulatory considerations.





5. Project Close (IP5)

When a project is materially, technically and financially complete, the project manager follows through with closure procedures.

A newly implemented investment planning system is designed to accomodate the collection of information and faciliate the approval processes.

An initiative is underway to create a quantitative prioritization mechanism and process to be used in line with this Planning and Approval process as recommended in the NY Management Audit.

Section 3 Investment Amount Summary

The Capital Investment Plan summarized by Company for the 5-years, 2020-2024, is presented in Figure 1 below:

Figure 1. NYSEG and RG&E Capital Investment Plan for 2020-2024 including Common







Chapter 4 Electric and Generation Capital Investment Forecast

This chapter will further detail by major investment category the overall Electric and Generation capital investments. (Chapters 5 and 6 will describe the Gas and Common plans respectively.) The categorization of the Plan is grouped into Customer, Capacity, Asset Condition, Reliability and Resiliency, Compliance, and Modernization. Section 1 below summarizes the major investment categories for the 5 years 2020-2024.





Section 1 Electric and Generation Capital Investment Requirements

The Capital Investment Forecast for 2020-2024 for NYSEG Electric and Generation (Figure 2) and for RG&E Electric and Generation (Figure 3) are shown below.

	А		В		С		D		Е		F
		F	orecast								
	\$ in thousands		2020		2021		2022		2023		2024
1	Customer	\$	30,569	\$	31,159	\$	27,011	\$	27,803	\$	29,519
2	Capacity		28,688		40,335		59,735		80,895		58,070
3	Asset Condition, Reliability, Resiliency		159,846		159,869		215,138		240,919		293,487
4	System Operations		2,269		2,333		2,398		2,465		2,534
5	Compliance		61,240		106,447		94,354		58,409		127,790
6	Modernization		95,915		154,562		126,410		103,688		81,089
7	Generation		11,052		5,791		6,120		5,274		6,741
8	Common		55,320		71,760		68,374		44,299		53,978
9	Total	\$	444,899	\$	572,255	\$	599,540	\$	563,752	\$	653,208
10			-		-						

Figure 2. NYSEG Electric and Generation Capital Investment Forecast for 2020-2024

11 Note: NYSEG Electric Common Allocation is 80.26%.

Figure 3	RG&E Electric and	Generation Ca	nital Investment	Enrecast for	2020-2024
i iyule J.	NOAL LIEUTIC and	Generation Ca	pital investment	i ulecast iul	2020-2024

	A		В		С		D		Е		F
		F	Forecast		orecast	F	orecast	F	orecast	F	orecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Customer	\$	12,153	\$	12,187	\$	12,081	\$	12,521	\$	13,271
2	Capacity		136,045		35,175		42,999		18,920		29,709
3	Asset Condition, Reliability, Res		141,403		124,665		137,601		129,419		120,134
4	System Operations		770		791		813		836		860
5	Compliance		13,210		21,171		15,433		9,097		37,214
6	Modernization		27,432		43,846		33,469		27,495		15,175
7	Generation		8,973		18,313		14,728		13,575		18,325
8	Common		24,698		26,914		26,029		22,547		23,621
9	Total	\$	364,683	\$	283,063	\$	283,153	\$	234,410	\$	258,308

¹⁰

11 Note: RG&E Electric Common Allocation is 71.39%.





Section 2 Electric Customer Capital Investment Forecast

This category provides a further breakdown of expenditures required to accommodate new customer connections, customer lighting, and state and municipal relocation construction.

The Electric Customer Capital Investment Forecast for 2020-2024 is summarized for NYSEG Electric in Figure 4 and for RG&E Electric in Figure 5.

А			В		С		D		Е		F
			orecast	F	orecast	F	orecast	F	orecast	F	orecast
_	<i>\$ in thousands</i>	2020			2021		2022	2023			2024
1	New Connections	\$	20,182	\$	20,461	\$	21,056	\$	21,670	\$	23,202
2	State & Municipal		4,081		4,203		4,329		4,459		4,593
3	Customer Lighting		6,306		6,495		1,625		1,674		1,724
4	Total	\$	30,569	\$	31,159	\$	27,011	\$	27,803	\$	29,519

Figure 4. NYSEG Electric Customer Capital Investment Forecast for 2020-2024

Figure 5. RG&E Electric Customer Capital Investment Forecast for 2020-2024

А			В		С		D		Е		F
			orecast	F	orecast	F	orecast	F	orecast	F	Forecast
_	\$ in thousands		2020		2021		2022	2023			2024
1	New Connections	\$	9,809	\$	9,786	\$	10,070	\$	10,463	\$	11,165
2	State & Municipal		1,373		1,402		1,431		1,461		1,491
3	Customer Lighting		971		1,000		580		597		615
4	Total	\$	12,153	\$	12,187	\$	12,081	\$	12,521	\$	13,271





The following describes the types of forecasted capital investments for customer related projects and programs:

- New Connections The projects in this category are required for constructing, expanding, replacing, or relocating electric infrastructure assets to connect customers. These projects range from routine connections of residential and commercial customers to larger scale projects that require significant modifications to the system. Meters required as part of customer projects are also included on this line item. These projects are mandatory to serve customers and the dollars shown reflect any expected customer reimbursements.
- State and Municipal Projects requiring the Companies to relocate, construct, expand, or replace electric infrastructure as it relates to state and municipal construction are included in this category. Most often the project work includes relocation of conductors, poles, and other equipment to accommodate state and municipal highway or other construction projects. These projects are considered mandatory to serve customers.
- Customer Lighting Streetlight and customer private area lighting replacements are included in this category. Streetlights are generally being replaced with light-emitting diode ("LED") technology, and this replacement may also require other infrastructure changes. LED replacement tariffs were approved by the Commission in November 2017 and, currently, LED lighting is being offered to 492 municipalities within NYSEG's service territory and 88 municipalities within RG&E's service territory. The Companies are required to





offer streetlight replacement to LED to all municipalities on a first come, first served basis. At present, 276 municipalities within NYSEG's service area and 27 municipalities in RG&E's service area have requested more information about the Companies' proposal to change streetlights to LED technology. Currently, 161 municipalities at NYSEG and 12 municipalities at RG&E have accepted the proposal to convert to LED, with 101 – NYSEG and 5 RG&E municipalities' LED conversions complete. Some of the benefits associated with the LED Streetlight replacement program include energy conservation, positive environmental impact due to decreased light trespass and no mercury content (reducing hazardous waste), lower maintenance costs due to longer expected life, and improved visibility thereby increasing safety.

Section 3 Electric Capacity Capital Investment Forecast

Routinely, commercial and residential customers open accounts, close accounts, and move within the NYSEG and RG&E territory. Growth will naturally result as this happens. The Companies monitor growth within the territory and introduce projects to accommodate it. This line item includes capacity projects to continue to provide reliable service to our customers.

The Electric Capacity Capital Investment Forecast associated for 2020-2024 is summarized for NYSEG Electric in Figure 6 and for RG&E Electric in Figure 7.

Figure 6. NYSEG Electric Capacity Capital Investment Forecast for 2020-2024



	A		В		С		D	E			F
		F	orecast	F	orecast	F	orecast	F	orecast	I	Forecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Substations New & Upgrades	\$	20,685	\$	39,489	\$	58,871	\$	80,012	\$	57,805
2	Large Capacity Projects		6,674		-		-		-		-
3	Non-wire Alternative (NWA)		1,328		846		865		883		265
4	Total	\$	28,688	\$	40,335	\$	59,735	\$	80,895	\$	58,070

Figure 7. RG&E Electric Capacity Capital Investment Forecast for 2020-2024

	А		В		С		D		Е		F
		F	orecast	F	orecast	F	orecast	F	orecast	F	Forecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Substations New & Upgrades	\$	31,667	\$	29,298	\$	42,999	\$	18,920	\$	29,709
2	Large Capacity Projects		104,378		5,877		-		-		-
3	Total	\$	136,045	\$	35,175	\$	42,999	\$	18,920	\$	29,709

The Capacity projects in the Capital Investment Plan are described as follows:

Substations New & Upgrades – To address capacity issues on the systems, the Companies are planning a number of substation upgrades which includes work such as adding additional transformers, capacitor bank, breakers, and/or other associated equipment. Large substation upgrade projects forecast at NYSEG for 2020-2024 include Coopers Corners Substation (\$70 million), Hilldale Substation (\$31 million), Sloan Substation (\$27 million), Carmel Substation (\$25 million), Wood Street Substation (\$22 million), Roll Road Substation (\$19 million), Lyon Mountain Substation (\$18 million), and North Broadway Substation (\$10 million). At RG&E, the larger substation upgrades during 2020-2024 include Substation 82 (\$82 million), Substation 156 (\$26 million), Substation 192 (\$14 million), and Substation 168 (\$13 million). These





projects are planned to address peak load conditions, reduce exposure of widespread outages, and improve reliability.

- Large Capacity Projects In the capital forecast, there is the completion of two large capacity projects, one at RG&E and one at NYSEG. At RG&E, the Rochester Area Reliability Project (RARP) is represented on this line item with forecasted spend of \$110 million in 2020-2021 and a total project cost expected at completion of \$363 million. This project includes the construction of a new 345kV Bulk Power System Station (Station 255) that will be interconnected with two NYPA 345kV transmission lines and the construction of a new 345kV line.
- Non-wires Alternatives (NWA) As part of the annual planning process, system needs are reassessed and alternative solutions are explored. While many solutions are traditional, focusing on a "wires" solution, the Companies also investigate potential cost-effective alternatives to traditional infrastructure investments through the use of market means to develop and finance a solution for a particular need. This is further discussed in Chapter 11 of this document.

Section 4 <u>Electric Asset Condition, Reliability and Resiliency Capital</u> <u>Investment Forecast</u>

The projects and programs in this category address NYSEG and RG&E's core mission of providing reliable electric service and repairing or preventing damage to the electric system caused by failure of equipment. Improving reliability is inherent in the group of projects in this category.





The Electric Asset Condition Replacement, Reliability, and Resiliency Capital Investment Plan for 2020-2024 is summarized for NYSEG Electric in Figure 8 and for RG&E Electric in Figure 9.

Figure 8. NYSEG Electric Asset Condition Replacement, Reliability, and Resiliency Capital Investment Forecast for 2020-2024

А		В		С		D		E			F
			Forecast		orecast	Forecast		Forecast		F	orecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Substation Rebuilds & Replacements	\$	48,571	\$	53,438	\$	61,015	\$	43,899	\$	67,054
2	Betterments		10,115		10,328		10,545		10,766		11,352
3	Transformer Replacement		2,463		1,593		2,690		7,110		14,550
4	Distribution Line Inspection Replacements		12,731		13,113		13,506		13,911		14,329
5	Conductor Replacement		66,033		56,757		96,782		133,273		141,203
6	Resiliency Plan		19,895		24,640		30,600		31,960		45,000
7	Other Asset Condition, Reliability, Resiliency		38		-		-		-		-
8	Total	\$	159,846	\$	159,869	\$	215,138	\$	240,919	\$	293,487

Figure 9. RG&E Electric Asset Condition Replacement, Reliability, and Resiliency Capital Investment Forecast for 2020-2024

С А в D Е Forecast Forecast Forecast Forecast Forecast 2023 \$ in thousands 2020 2021 2022 1 Substation Rebuilds & Replacements \$ 50.925 \$ 26.442 \$ 14,845 \$ 25,689 \$ 2 Betterments 4.153 4,278 4.406 4,538

2	Betterments	4,153	4,278	4,406	4,538	4,674
3	Transformer Replacement	14,057	14,944	13,959	16,402	14,165
4	Distribution Line Inspection Replacements	2,652	2,732	2,814	2,898	2,985
5	Conductor Replacement	56,904	63,088	84,739	66,843	46,536
6	Resiliency Plan	6,670	8,260	10,200	10,540	17,000
7	Other Asset Condition, Reliability, Resiliency	6,043	4,921	6,638	2,509	4,454
8	Total	\$ 141,403	\$ 124,665	\$ 137,601	\$ 129,419	\$ 120,134

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This category highlights a number of important projects and programs aimed at maintaining and improving system reliability, addressing the asset condition of the infrastructure, ensuring operability and flexibility of the system, and improving the performance of the electric system during adverse weather conditions.

The projects and programs included in this category are described as follows:

- Substation Rebuilds and Replacements The update of the Companies' distribution substations includes the replacement of substation equipment and structures due to age and condition. In addition, modernization will leverage Supervisory Control and Data Acquisition ("SCADA") within the substations to increase remote monitoring and control capabilities at the stations along with the installation of a telecommunications platform to provide a communication path to the Energy Control Center. This category includes substation modernization and automation, breaker replacements, battery bank replacements, and other substation rebuilds and minor improvements.
- Betterments This program is focused on maintaining the reliability, operability and flexibility of the distribution system. These are distribution system improvement projects that are identified each year by distribution engineers based on a review circuits throughout the system that do not meet the reliability or distribution planning criteria and by operations personnel identifying operational issues and concerns. The projects address the Companies' worst-performing circuits, the causes of outages, and the results of analysis of trends that may negatively impact reliability.
- **Transformer Replacement** This program is the forecast for the replacement of substation transformers that have reached the end of their useful life and the





purchase of spare substation transformers needed to provide that adequate back-up equipment is available for emergency replacements. In general, 34/12kV 10/14MVA transformers are included in this program.

- Distribution Line Inspection (DLI) Replacement This program provides for the replacement of distribution line assets identified by the DLI inspection program. This program is intended to alleviate potential reliability concerns proactively before system performance is affected. Common issues found include defective cross arms, poles, cutouts, transformers, insulators, among other.
- Conductor Replacement This category includes both planned and unplanned conductor replacement projects. The planned conductor projects include replacement of overhead and underground cable due to various asset conditions. This category includes transmission work generally related to transmission structures and distribution line work related to distribution pole replacements, distribution rights-of-way, and car pole hits. Cable segments identified with asset health needs are prioritized for replacement and are addressed in this program as well.
- Resiliency Plan The Resiliency Plan capital expenditures are a subset of the comprehensive Electric Capital Investment Plan presented in this document. The key elements of the Resiliency Plan include hardening and topology along with automation. From a holistic perspective, the Resiliency Plan also includes enhanced vegetation management (O&M expenditures) along with these capital expenditures. An overview of the Resiliency Plan can be found in Chapter 10 of this document.





 Other Asset Condition – Included in this category are projects related to general operations equipment replacement, a pilot wire replacement project at RG&E, an underground cable injection project at RG&E, and other smaller operations projects related to asset condition replacement. The Pilot Wire Replacement Project will replace the existing Pilot Wire (PW) cables located around the RG&E network; this will improve system reliability. The Underground Cable Injection program will treat XLPE cable by injecting insulating fluid to fill voids to address potential treeing issues that lead to cable failures.

Section 5 Electric System Operations Capital Investment Forecast

The capital expenditures in the System Operations category include operations equipment and storm restoration forecasts.

The Electric System Operations Capital Investment Forecast for 2020-2024 is summarized for NYSEG Electric in Figure 10 and for RG&E Electric in Figure 11.

Figure 10. NYSEG Electric System Operations Capital Investment Forecast for 2020-2024

А		В		С		D		Е		F
	For	ecast	Forecast			Forecast	F	Forecast	F	Forecast
\$ in thousands	2	020	2021		2022		2023		2024	
1 Operations	\$	1,689	\$	1,735	\$	1,782	\$	1,830	\$	1,880
2 Storm Restoration		581		598		616		635		654
3 Total	\$	2,269	\$	2,333	\$	2,398	\$	2,465	\$	2,534





				2024							
А	E	В		С		D		Е		F	
	Fore	cast	F	orecast	F	Forecast	F	orecast	F	Forecast	
\$ in thousands	20	20		2021		2022		2023		2024	
1 Operations	\$	429	\$	440	\$	452	\$	463	\$	476	
2 Storm Restoration		341		351		362		373		384	
3 Total	\$	770	\$	791	\$	813	\$	836	\$	860	

Figure 11. RG&E Electric System Operations Capital Investment Forecast for 2020-

Section 6 Electric Compliance Capital Investment Forecast

The capital expenditures in the Compliance category are expenditures to meet with regulatory or other mandated orders. This category includes the Bulk Electric System ("BES") program and NERC Alert projects.

The Electric Compliance Capital Investment Plan for 2020-2024 is summarized for NYSEG Electric in Figure 12 and for RG&E Electric in Figure 13.

Figure 12. NYSEG Electric Compliance Capital Investment Forecast for 2020-2024

	A	A B		С			D		Е		F	
		Forecast		Forecast		Forecast		Forecast		Forecast		
	\$ in thousands		2020		2021		2022		2023		2024	
1	BES	\$	52,132	\$	97,339	\$	85,246	\$	49,301	\$	116,354	
2	NERC Alert		9,108		9,108		9,108		9,108		11,436	
3	Total	\$	61,240	\$	106,447	\$	94,354	\$	58,409	\$	127,790	

Figure 13. RG&E Electric Compliance Capital Investment Forecast for 2020-2024





	A	В		С		D		E		F	
		Forecast		Forecast		Forecast		Forecast		Forecast	
	\$ in thousands		2020		2021		2022		2023		2024
1	BES	\$	12,210	\$	20,171	\$	14,433	\$	8,097	\$	35,233
2	NERC Alert		1,000		1,000		1,000		1,000		1,981
3	Total	\$	13,210	\$	21,171	\$	15,433	\$	9,097	\$	37,214

Projects and programs in this category are described as follows:

- BES This line item refers to the Bulk Electric System (BES) program at NYSEG and RG&E. The objective of this program is to identify and address system deficiencies on the portion of the Companies' bulk electric system in compliance with mandatory reliability standards. This program is described in further detail in Chapter 7 of this document.
- NERC Alert The NERC Alert projects are the result of the 2010 NERC Alert mandate requiring correction of ground clearances that do not meet NESC standards. Many of the costs associated with increasing ground clearances to meet standards are for the replacement of structures.

Section 7 Electric Modernization Capital Investment Forecast

Modernization investments are an important capital investment in the NYSEG and RG&E capital investment portfolios. Primary projects included in this category are associated with REV initiatives and include AMI and DSIP. The use of technology to communicate with the system and customers is a key component to operating the electric system in today's evolving environment. It enables the integration of clean energy resources and provides customers with the tools to be able to take greater control over their energy usage. AMI and DSIP projects will provide for increased





efficiency in operating the system as well as a more reliable network. Business systems, likewise, will provide tools to enhance efficiency and adaptable to the changing environment.

The Electric Modernization Capital Investment Plan for 2020-2024 is summarized for NYSEG Electric in Figure 14 and for RG&E Electric in Figure 15.

Figure 14. NYSEG Electric Modernization Capital Investment Forecast for 2020-2024

	А		В		С		D		E		F
		F	Forecast		Forecast		Forecast		Forecast		Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Business Systems	\$	200	\$	203	\$	206	\$	209	\$	5,909
2	AMI		42,663		83,971		62,382		51,223		13,702
3	DSIP		52,209		70,105		63,822		52,256		61,255
4	Energy Smart Community		843		283		-		-		223
5	Total	\$	95,915	\$	154,562	\$	126,410	\$	103,688	\$	81,089

Figure 15. RG&E Electric Modernization Capital Investment Forecast for 2020-2024

	A	В		С		D		Е		F	
		Forecast		Forecast		Forecast		Forecast		I	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Business Systems	\$	40	\$	41	\$	41	\$	42	\$	1,238
2	AMI		19,070		34,653		24,776		22,149		5,921
3	DSIP		8,323		9,153		8,652		5,304		8,016
4	Total	\$	27,432	\$	43,846	\$	33,469	\$	27,495	\$	15,175

The investments related to modernization are described as follows:





- Business Systems Projects in this category are typically technology-based solutions stemming from specific business requirements to improve accuracy, functionality and execution of the work of the Companies.
- AMI This line item reflects the current estimate and timing for the deployment of approximately 1.9 million electric smart meters throughout our service territories in a project known as AMI (Advanced Metering Infrastructure). AMI is foundational to delivering REV-related benefits to customers, and it provides for the implementation of smart electric meters and the supporting IT infrastructure required supporting the acquisition, storage and analysis of data collected by the AMI meters. More details regarding the AMI program can be found in Chapter 9 of this document.
- DSIP This line item represents the projects associated with Distribution Automation and other projects supporting the transition of the Companies to be the Distribution System Platform Provider under REV. These projects include Line Automation, Substation Automation, Enterprise Analytics, Electric Vehicles, Grid Optimization, among others. More details regarding the DSIP program can be found in Chapter 8 of this document.
- Energy Smart Community The aim of this project, which was initially established in the prior rate plan, is to provide a test-bed for Reforming the Energy Vision ("REV") concepts in a small-scale environment which will advance the Companies' ability to serve as the Distributed Systems Platform Provider ("DSPP"). This approach allows the Companies to deploy certain foundational investments in a concentrated geographical area.




Section 8 Generation Capital Investment Forecast

The NYSEG generating facilities currently include twelve hydroelectric and three small fossil-fueled facilities having a total nameplate capacity of approximately 71 MW. The hydroelectric plants are located from Plattsburgh in the northeast through the southern tier. The RG&E facilities include three hydroelectric facilities having a nameplate capacity of 58 MW; all facilities are located within the City of Rochester. All hydro facilities are under Federal Energy Regulatory Commission (FERC) and New York State Department of Environmental Conservation jurisdiction. All operating hydroelectric generating plants are run-of-the-river facilities, meaning they cannot store water, but produce energy from the river flow that is available at the time in the respective watershed. The hydro facilities have the capacity to produce approximately 527 MWh of renewable energy annually.

Currently, NYSEG fossil-fueled generating facilities include a 7.3 MW natural gas-fired simple cycle (leased) unit in Auburn and two (2) standby diesel generators, with a combined output of 4 MW, located at the Harris Lake Substation in the Adirondack State Park. The latter units produce electric energy to serve local customers in the event of a 46 kV transmission line outage. RG&E does not have any operational fossil-fueled generating facilities.

The objective is to maximize the hydroelectric energy produced for our customers from the water that is available and to maintain two of the three existing small fossil units so that they are available when required to support local load centers / networks as dispatched by NYISO and/or to provide energy during certain system network outages. The investment strategy is to implement betterment projects that improve unit / station





reliability and efficiency, increase capacity, replace aging or obsolete infrastructure/assets, protect the environment and safeguard the Companies' employees and the public. Moreover, we also make investments to fulfill regulatory obligations for the hydroelectric facilities under the jurisdiction of FERC or the New York Department of Environmental Conservation.

The Generation Capital Investment Plan for 2020-2024 is summarized for NYSEG Electric in Figure 16 and for RG&E Electric in Figure 17.

Figure 16. NYSEG Generation Capital Investment Forecast for 2020-2024

	A		В		С		D		E		F
		F	Forecast	F	Forecast	F	Forecast	F	orecast	F	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Generation Asset Condition	\$	9,552	\$	4,291	\$	4,620	\$	3,774	\$	5,241
2	Generation System Operations		1,500		1,500		1,500		1,500		1,500
3	Total	\$	11,052	\$	5,791	\$	6,120	\$	5,274	\$	6,741

Figure 17. RG&E Generation Capital Investment Forecast for 2020-2024

	А		В		С		D		Е		F
		F	Forecast	F	orecast	F	Forecast	F	Forecast	F	orecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Generation Asset Condition	\$	1,125	\$	1,650	\$	1,525	\$	3,725	\$	4,975
2	Generation Capacity		6,348		15,113		10,953		7,600		11,800
3	Generation System Operations		1,500		1,550		2,250		2,250		1,550
4	Total	\$	8,973	\$	18,313	\$	14,728	\$	13,575	\$	18,325

The investments related to Generation are explained as follows:





- Generation Asset Condition Projects in this category address equipment that has reached its useful life or obsolete in order to provide safe and reliable service. Larger projects include at NYSEG include Mill Ct, Kent Falls, and Mechanicville Hydro Spillway Resurfacing and at RG&E include Station 5.
- Generation Capacity The investment shown on this line item are related to renovations at RG&E Station 2 to enable more efficient operation of the system and to expand its capacity by adding a second turbine. There are currently two phases planned for this project.
- Generation System Operations This line item includes minor capital expenditures and equipment needed to maintain the system at the Fossil and Hydro generating plants.

Section 9 Electric Common Capital Investment Forecast

The Common capital investments include fleet, facilities, security, operational efficiency projects and information technology projects. These expenditures are considered Common because they benefit both electric and gas lines of business at each Company. At NYSEG, common investments are currently allocated 80.26% to electric and 19.74% to gas, and at RG&E, common investments are currently allocated 71.39% to electric and 28.61% to gas.

The Common Electric Capital Investment Plan for 2020-2024 is summarized for NYSEG Electric in Figure 18 and for RG&E Electric in Figure 19.





A		В		С		D		Е		F
	F	orecast	F	Forecast	I	Forecast	F	orecast	F	orecast
\$ in thousands		2020		2021		2022		2023		2024
1 Information Technology	\$	18,979	\$	21,811	\$	17,183	\$	17,979	\$	18,396
2 Fleet		12,383		18,901		10,889		5,637		14,672
3 Facilities		2,355		2,828		7,508		3,591		9,156
4 Security		14,811		18,719		27,295		9,092		6,836
5 Operational Technology		6,722		9,157		5,473		8,183		4,700
6 Other Common		71		343		26		(182)		217
7	\$	55,320	\$	71,760	\$	68,374	\$	44,299	\$	53,978

Figure 18. NYSEG Electric Common Capital Investment Forecast for 2020-2024

Figure 19. RG&E Electric Common Capital Investment Forecast for 2020-2024

	A		В		С		D		Е		F
		F	orecast	I	Forecast	F	Forecast	F	orecast	F	orecast
	<i>\$ in thousands</i>		2020		2021		2022		2023		2024
1	Information Technology	\$	5,302	\$	6,129	\$	5,456	\$	8,029	\$	8,214
2	Fleet		3,257		3,320		3,389		3,464		4,117
3	Facilities	*	2,507		1,757		2,792		3,042		4,930
4	Security		7,372		8,712		10,013		4,105		3,050
5	Operational Technology		6,160		6,853		4,272		3,800		2,027
6	Other Common		100		143		107		107		1,282
7		\$	24,698	\$	26,914	\$	26,029	\$	22,547	\$	23,621

The Common projects are described in further detail in Chapter 6 of this plan.

Chapter 5 Gas Capital Investment Forecast

The majority of gas is purchased from interstate gas transmission pipelines and received at system gate stations, where gas flow is metered and regulated and the ownership or custody of the gas transfers from the delivering pipeline to the Companies. Gas is odorized at these facilities. The gate stations reduce the incoming interstate





transmission pressure to company system pressures. The Companies also receive gas from local well producers at several locations. The Companies' systems transport gas from the gate stations to the district regulator stations and field regulators where the pressure is further reduced, controlled, and monitored to meet customer needs. Service laterals connect the local distribution system to customers' meters.

This chapter will further detail by major investment category the Gas capital investments. These categories are designed to best describe the main drivers for the investments. Section 1 of this Chapter will show the major investment categories and each following section will provide a description of the category, forecasted expenditures, and further expand on the projects/programs for the 5 years 2020-2024.

Section 1 Gas Capital Investment Requirements

The Capital Investment Forecast for 2020-2024 for NYSEG Gas (Figure 20) and for RG&E Gas (Figure 21) is shown below categorized by investment category.

	А		В		С		D		Е		F
		F	orecast	F	Forecast	F	Forecast	F	Forecast	F	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Customer	\$	13,486	\$	13,710	\$	14,348	\$	14,991	\$	16,495
2	Asset Condition & Reliability		66,161		47,951		60,963		47,993		50,631
3	Modernization		16,334		26,993		18,909		14,925		3,502
4	Common		13,564		17,616		16,782		10,860		13,276
5	Total	\$	109,545	\$	106,270	\$	111,002	\$	88,769	\$	83,903
6											

Figure 20. NYSEG Gas Capital Investment Forecast for 2020-2024

7 Note: NYSEG Gas Common Allocation is 19.74%.

Figure 21. RG&E Gas Capital Investment Forecast for 2020-2024





	А		В		С		D		Е		F
		F	orecast	I	Forecast	F	orecast	F	Forecast	F	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Customer	\$	9,325	\$	15,395	\$	13,271	\$	13,796	\$	15,269
2	Asset Condition & Reliability		39,726		59,801		62,933		47,128		63,086
3	Modernization		8,024		19,098		16,253		14,082		3,840
4	Common		9,898		10,786		10,431		9,036		9,466
5	Total	\$	66,972	\$	105,080	\$	102,889	\$	84,043	\$	91,662

6

7 Note: RG&E Gas Common Allocation is 28.61%.

Section 2 Gas Customer Capital Investment Forecast

This category provides the level of expenditures required by tariff to serve new customers. This includes new installations, state and municipal relocation construction, and meters and regulators.

The Section 2 Natural Gas Customer Capital Investment Forecast for 2020-2024 is summarized for NYSEG Gas in Figure 22 and for RG&E Gas Figure 23.

	А		В		С		D		Е		F
		F	orecast	F	Forecast	F	orecast	F	orecast	I	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	New Installations	\$	8,606	\$	7,300	\$	7,447	\$	7,597	\$	7,749
2	State & Municipal		2,063		4,087		4,171		4,257		4,346
3	Meters and Regulators		2,817		2,323		2,730		3,137		4,400
4	Total	\$	13,486	\$	13,710	\$	14,348	\$	14,991	\$	16,495

Figure 22. NYSEG Gas Customer Capital Investment Forecast for 2020-2024

Figure 23. RG&E Gas Customer Capital Investment Forecast for 2020-2024





	A		В		С		D		E		F
		F	orecast	F	orecast	F	orecast	F	Forecast	F	orecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	New Installations	\$	6,534	\$	10,050	\$	7,702	\$	7,857	\$	7,912
2	State & Municipal		640		3,146		3,209		3,274		3,288
3	Meters and Regulators		2,150		2,199		2,360		2,665		4,070
4	Total	\$	9,325	\$	15,395	\$	13,271	\$	13,796	\$	15,269

The following describes the forecasted capital investments for customer related projects and programs:

- **New Installations** This line item is expenditures associated with connecting customers including the installations of mains and services.
- State & Municipal This line item includes highway relocation projects that involve gas facility relocations and replacements required due to conflicts with street and highway reconstruction projects. Costs associated with facilities located in easements on private property are generally reimbursable by the municipality. Relocation of the facilities prior to the start of the public project reduces the potential for damage to facilities and limits unscheduled interruption of service to customers in the affected surrounding area.
- Meters and Regulators This line item includes: new meters and regulators to serve new customers, upgraded meters for existing customers, and the replacement of meters identified through the alternate accuracy in test program. This line item does not include costs related to the AMI project; AMI expenditures are found in the modernization category.





Section 3 Gas Asset Condition and Reliability Capital Investment Forecast

This category includes projects that focus on improving the effectiveness and efficiency of the delivery network by replacing obsolete equipment and facilities due to physical or technological obsolescence or extensive maintenance costs. Additionally, projects aimed at achieving service reliability and quality targets by reducing reliability risks are included.

The Asset Condition and Reliability Capital Investment Forecast for 2020-2024 is summarized for NYSEG Gas in Figure 24 and for RG&E Gas Figure 25.

	A	F	B Forecast	F	C Forecast	F	D Forecast	F	E Forecast	I	F Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Leak Prone Main Replacement	\$	34,870	\$	36,591	\$	51,328	\$	37,080	\$	38,556
2	Regulators and Gate Stations		6,024		3,024		3,024		3,024		3,024
3	Distribution Main Replacements		22,690		4,244		3,299		3,356		2,913
4	Transmission Main Replacemer		132		-		-		-		-
5	System Reliability		1,475		3,100		2,300		3,500		5,083
6	Other Asset Condition		970		991		1,011		1,033		1,055
7	Total	\$	66,161	\$	47,951	\$	60,963	\$	47,993	\$	50,631

Figure 24. NYSEG Gas Asset Condition and Reliability Capital Investment Forecast for 2020-2024

Figure 25. RG&E Gas Asset Condition and Reliability Capital Investment Forecast for 2020-2024





	А		В		С		D		Е		F
		F	Forecast	F	Forecast	I	Forecast	F	orecast	F	Forecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Leak Prone Main Replacement	\$	26,162	\$	26,678	\$	26,704	\$	27,241	\$	27,788
2	Regulators and Gate Stations		3,185		3,998		4,079		6,161		22,245
3	Distribution Main Replacements		976		996		1,016		1,036		1,057
4	Transmission Main Replacemer		8,199		21,000		23,500		4,500		7,500
5	System Reliability		730		6,650		7,150		7,700		4,000
6	Other Asset Condition		473		478		484		490		496
7	Total	\$	39,726	\$	59,801	\$	62,933	\$	47,128	\$	63,086

This category highlights projects and programs that address asset condition replacement and reliability concerns. The following provides further explanation of this category:

- Leak Prone Main Replacement This line item captures the forecast to replace miles of mains and related services per year using Distribution Integrity Management Plan ("DIMP") as a basis for prioritization. This program will reduce leaks and risks to the distribution system. For each Company, the forecast is based on 30 miles of main replaced per year. The number of leak prone service replacements will depend on the leak prone main replacement mileage and leak survey results. As the Companies replace the leak prone main, the services attached to those mains are likewise replaced. In addition, leaking services that require renewal (replacement) are often identified when the Companies perform their mandatory leak surveys.
- Regulators and Gate Stations The projects in this category include the replacement or addition of new gas piping and equipment at the stations due to asset condition and obsolescence or the need to increase system capacity to serve existing franchise areas. As part of station replacements, the facilities are





modernized and automated when applicable with new technology. Examples include: addition of a second regulator run to increase reliability of existing single run stations; obsolete regulator replacements; odorizer and other station equipment replacements; Remote Terminal Units ("RTUs"); installation of other remote automated measurement equipment within the transmission and distribution system; and automation of operation and/or inspection equipment for the station. Gate and regulator station facilities are critical components to the safety and reliability of the delivery system.

- Distribution Main Replacements The projects in this category replace gas mains that operate below 125 psig. Projects are developed to support the DIMP which addresses asset condition and risk, the need for system capacity to support load growth, and other distribution system needs for reliability and risk. Additionally, included in this category are projects to address leaks on existing services, replacement of services associated with main replacement projects, installation of services to new customers, and relocation of services as required by code or regulation. One of the larger Distribution Main Replacement projects at NYSEG is the Vienna Rd-Macedon Feeder Main Replacement project which will install approximately 39,500 feet of 10" steel gas main from the Vienna Road Regulator station to Palmyra City Gate Regulator Station. The existing system is below 50% of maximum allowable operating pressure (MAOP) on the design day. These improvements will reinforce the system and improve reliability and pressure.
- Transmission Main Replacements These projects include replacing gas mains that operate at or above 125 psig. Projects are developed to support the Transmission Integrity Management Plan ("TIMP") which addresses asset





condition and risk, the need for system capacity to support demand, the balancing of gas supply, and other transmission main needs for system reliability and risk. At RG&E, the large transmission replacement projects include CM-1 Transmission Gas Main Replacement, and CM-1 Transmission Pipeline Paul Rd to Buffalo Rd.

- System Reliability This line captures expenditures for projects related to reliability projects to address pressure and capacity issues. The large reliability projects in the forecast at NYSEG include the Albion Eastern System Improvement and Reiliability Project and at RG&E the MF120 Western Monroe Reinforcement projects and the MF60 Southeast projects. In addition, as a result of the incident in the Merrimack Valley (Columbia of MA), the Companies established a Low Pressure Relief Valve program which adds a full capacity, atmospheric relief valve to all low pressure regulator stations that are constructed with a regulator/monitor configuration. This program, likewise, is included on this line item.
- Other Asset Condition This includes general tools for Gas Field Operations, critical valve installations, and RG&E transmission short segment gas mains.

Section 4 Gas Modernization Capital Investment Forecast

When gate and regulator stations are modernized, they include remote operations and monitoring equipment as appropriate to best support operations. The customer benefits resulting from this work are improved crew efficiency and reduction of time to assess and address operational issues with equipment. Proper operation of the equipment within the gate and regulator stations is necessary to support the provision of safe and reliable gas service.





The Modernization Capital Investment Forecast for 2020-2024 is summarized for NYSEG Gas in Figure 26 and for RG&E Gas Figure 27.

Figure 26. NYSEG Gas Modernization Capital Investment Forecast for 2020-2024

	A		В		С		D		E		F
		F	orecast	F	Forecast	I	Forecast	F	orecast	F	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Business Systems	\$	5,800	\$	5,325	\$	2,500	\$	2,000	\$	-
2	AMI		10,534		21,668		16,409		12,925		3,502
3	Total	\$	16,334	\$	26,993	\$	18,909	\$	14,925	\$	3,502

Figure 27. RG&E Gas Modernization Capital Investment Forecast for 2020-2024

А	В		С		D		Е		F
	Forecas	t	Forecast	F	orecast	F	Forecast	F	Forecast
\$ in thousands	2020		2021		2022		2023		2024
1 AMI	\$ 8,0	24 \$	19,098	\$	16,253	\$	14,082	\$	3,840

The projects and programs related to Modernization are as follows:

- System Automation The projects include the Supervisory Control and Data Acquisition ("SCADA") replacements and upgrades and Remote Terminal Units ("RTUs"); installation of other remote automated measurement equipment within the transmission and distribution system.
- AMI AMI is a foundational platform in support of New York State Energy Policy and the objectives of New York's Reforming the Energy Vision (REV). Further description on the scope and benefits of this project can be found in Chapter 9 of this document.





Section 5 Gas Common Capital Investment Forecast

The Common capital investments include fleet, facilities, security, operational efficiency and information technology projects. These expenditures are for projects that benefit both electric and gas businesses. At NYSEG, common investments are currently allocated 80.26% to electric and 19.74% to gas, and at RG&E, common investments are currently allocated 71.39% to electric and 28.61% to gas.

The Common Gas Capital Investment Forecast for 2020-2024 is summarized for NYSEG Gas in Figure 28 and for RG&E Gas in Figure 29.

	A		В		С		D		E		F
		F	orecast	I	Forecast	F	Forecast	F	orecast	F	orecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Information Technology	\$	4,626	\$	5,331	\$	4,192	\$	4,387	\$	4,525
2	Fleet		3,045		4,649		2,678		1,386		3,609
3	Facilities		579		696		1,846		883		2,252
4	Security		3,643		4,604		6,713		2,236		1,681
5	Operational Technology		1,653		2,252		1,346		2,013		1,156
6	Other Common		17		84		6		(45)		53
7	Total	\$	13,564	\$	17,616	\$	16,782	\$	10,860	\$	13,276

Figure 28. NYSEG Gas Common Capital Investment Forecast for 2020-2024

Figure 29. RG&E Gas Common Capital Investment Forecast for 2020-2024





А		В		С		D		Е		F
	F	orecast	I	Forecast	I	Forecast	F	orecast	F	orecast
\$ in thousands		2020		2021		2022		2023		2024
1 Information Technology	\$	2,125	\$	2,456	\$	2,187	\$	3,218	\$	3,292
2 Fleet		1,305		1,331		1,358		1,388		1,650
3 Facilities	F	1,004		704		1,119		1,219		1,976
4 Security		2,954		3,492		4,013		1,645		1,222
5 Operational Technology		2,469		2,747		1,712		1,523		812
6 Other Common		40		57		43		43		514
7 Total	\$	9,898	\$	10,786	\$	10,431	\$	9,036	\$	9,466

The Common projects are described in further detail in Chapter 6 of this plan.

Chapter 6 Common Capital Investment Forecast

The common classification for projects and programs are applicable to both the electric business and the gas businesses. The costs, as needed, are split first by Company based on factors that can vary by project. Once the amount has been established for each Company, an allocation factor is used to assign common capital costs to electric and gas. The allocation factor established for each Company as part of the last rate plan is: NYSEG 80.26% to Electric and 19.74% to Gas; RG&E 71.39% to Electric and 28.61% to Gas. This chapter describes the combined gas and electric project for each of the Companies.

The combined Common for 2020-2024 is shown below in Figure 30 for NYSEG Electric and Gas and Figure 31 for RG&E Electric and Gas.





				202	20-2024						
	А		В		С		D		Е		F
		F	orecast	F	orecast	F	orecast	F	orecast	I	Forecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Information Technology	\$	23,605	\$	27,142	\$	21,375	\$	22,366	\$	22,921
2	Fleet		15,428		23,550		13,567		7,023		18,281
3	Facilities		2,934		3,524		9,354		4,474		11,408
4	Security		18,454		23,323		34,009		11,328		8,518
5	Operational Technology		8,375		11,410		6,819		10,195		5,856
6	Other Common		88		427		32		(227)		271
7	Total	\$	68.884	\$	89.375	\$	85,156	\$	55,160	\$	67.253

Figure 30. NYSEG Total Common Capital Investment Forecast for Electric and Gas

Figure 31. RG&E Total Common Capital Investment Forecast for Electric and Gas 2020-2024

	А		В		С		D		Е		F
		Fo	orecast	F	Forecast	F	orecast	F	orecast	F	orecast
_	\$ in thousands		2020		2021		2022		2023		2024
1	Information Technology	\$	7,427	\$	8,585	\$	7,643	\$	11,246	\$	11,506
2	Fleet		4,562		4,651		4,747		4,853		5,767
3	Facilities		3,511		2,461		3,911		4,261		6,906
4	Security		10,326		12,204		14,026		5,751		4,272
5	Operational Technology		8,629		9,600		5,984		5,323		2,839
6	Other Common		140		200		150		150		1,796
7	Total	\$	34,595	\$	37,700	\$	36,461	\$	31,583	\$	33,087

The following sections 1-7 provide details into each of these portfolios of projects.

Section 1 Information Technology Capital Investment Forecast

The combined electric and gas Information Technology common forecast is shown for NYSEG and RG&E in Figure 32.





Figure 32. NYSEG and RG&E Total Electric and Gas Information Technology Common Capital Investment Forecast for 2020-2024

A	В			С		D		Е		F
	Fo	recast	Fo	orecast	F	orecast	F	orecast	F	orecast
\$ in thousands	2	2020		2021		2022		2023		2024
1 NYSEG Electric	\$	18,979	\$	21,811	\$	17,183	\$	17,979	\$	18,396
2 NYSEG Gas		4,626		5,331		4,192		4,387		4,525
3 Subtotal NYSEG		23,605		27,142		21,375		22,366		22,921
4										
5 RG&E Electric		5,302		6,129		5,456		8,029		8,214
6 RG&E Gas		2,125		2,456		2,187		3,218		3,292
7 Subtotal RG&E		7,427		8,585		7,643		11,246		11,506
8										
9 Total	\$	31,032	\$	35,726	\$	29,018	\$	33,612	\$	34,427

As technology advances, NYSEG and RG&E's goal is to implement solutions that enable the business to implement solutions which deliver value to the business and ultimately the customer. The projects include in this program are upgrades and updates to software applications, new digital applications and platforms, as well as asset condition based replacements.

Section 2 Fleet Common Capital Investment Forecast

The combined gas and electric Fleet common planned expenditures are shown for NYSEG and RG&E in Figure 33.

Figure 33. NYSEG and RG&E Total Electric and Gas Fleet Common Capital Investment Forecast for 2020-2024





А		В		С		D		Е		F
	Fc	orecast	F	orecast	F	Forecast	F	orecast	F	orecast
\$ in thousands		2020		2021		2022		2023		2024
1 NYSEG Electric	\$	12,383	\$	18,901	\$	10,889	\$	5,637	\$	14,672
2 NYSEG Gas		3,045		4,649		2,678		1,386		3,609
3 Subtotal NYSEG		15,428		23,550		13,567		7,023		18,281
4										
5 RG&E Electric		3,257		3,320		3,389		3,464		4,117
6 RG&E Gas		1,305		1,331		1,358		1,388		1,650
7 Subtotal RG&E		4,562		4,651		4,747		4,853		5,767
8										
9 Total	\$	19,990	\$	28,201	\$	18,314	\$	11,876	\$	24,047

The capital expenditures for Fleet are for the replacement of vehicles and equipment and are based on established life cycle criteria (years, mileage, and/or hours). The criteria are documented in the Fleet Replacement Ordering Procedure maintained and updated by the Companies. Each year the Companies review the current fleet according to the established criteria and determine those vehicles that meet or exceed the replacement criteria.

Section 3 Facilities Common Capital Investment Forecast

The combined gas and electric Facilities common portfolio is shown for NYSEG and RG&E in Figure 34.

Figure 34. NYSEG and RG&E Total Electric and Gas Facilities Common Capital Investment Forecast for 2020-2024





A	I	В		С		D		Е		F
	Fore	ecast	Fo	recast	F	orecast	F	orecast	F	orecast
\$ in thousands	20)20	2	2021		2022		2023		2024
1 NYSEG Electric	\$	2,355	\$	2,828	\$	7,508	\$	3,591	\$	9,156
2 NYSEG Gas		579		696		1,846		883		2,252
3 Subtotal NYSEG		2,934		3,524		9,354		4,474		11,408
4										
5 RG&E Electric		2,507		1,757		2,792		3,042		4,930
6 RG&E Gas		1,004		704		1,119		1,219		1,976
7 Subtotal RG&E		3,511		2,461		3,911		4,261		6,906
8										
9 Total	\$	6,445	\$	5,985	\$	13,265	\$	8,735	\$	18,314

The facility investments are projects needed to maintain, update or replace the Companies' facilities due to asset condition, age, safety or environmental considerations. Project improvements typically are associated with mechanical, electrical, building structures, control systems, etc. The facilities projects are aimed at providing safe working conditions at all of our locations – office space, operations buildings and work centers.

Section 4 Security Common Capital Investment Forecast

The combined gas and electric Security common portfolio is shown for NYSEG and RG&E in Figure 35.





А		В		С		D		Е		F
	F	orecast	F	Forecast	ŀ	Forecast	F	Forecast	ŀ	Forecast
\$ in thousands		2020		2021		2022		2023		2024
1 NYSEG Electric	\$	14,811	\$	18,719	\$	27,295	\$	9,092	\$	6,836
2 NYSEG Gas		3,643		4,604		6,713		2,236		1,681
3 Subtotal NYSEG		18,454		23,323		34,009		11,328		8,518
4										
5 RG&E Electric		7,372		8,712		10,013		4,105		3,050
6 RG&E Gas		2,954		3,492		4,013		1,645		1,222
7 Subtotal RG&E		10,326		12,204		14,026		5,751		4,272
8										
9 Total	\$	28,780	\$	35,527	\$	48,035	\$	17,079	\$	12,790

Figure 35. NYSEG and RG&E Total Electric and Gas Security

Common Capital Investment Forecast for 2020-2024

Security capital investments are required for safety and security of employees and Company assets and to meet various security mandates and regulations, such as the NERC Critical Infrastructure Protection (CIP) Standards. Cost effective monitoring, management and alarm response for these systems is performed from a 24/7 central Security Operations Center (SOC). In 2016, a multi-year program was started to upgrade the telecom network carrying access control and video monitoring data to the SOC and complete installation or lifecycle replacement of security systems at various sites. Security systems deployed at sites are based on risk and regulatory requirements. High risk facilities (e.g., bulk substations) receive card access control systems, public address (PA) systems, video surveillance, video analytics and thermal cameras. Moderate risk facilities (e.g., large office/service center, store yards) receive card access control systems, video surveillance and video analytics. Low risk facilities currently rely on standard locks and fencing.





Section 5 Operational Technology Common Capital Investment

Forecast

The combined gas and electric Smart Grids common portfolio is shown for NYSEG and RG&E in Figure 36.

Figure 36. NYSEG and RG&E Total Electric and Gas Operational Technology Common Capital Investment Forecast for 2020-2024

	A		В		С		D		Е		F
		For	ecast	F	orecast	F	orecast	F	orecast	F	orecast
\$ in	thousands	2	020		2021		2022		2023		2024
1 NYS	SEG Electric	\$	6,722	\$	9,157	\$	5,473	\$	8,183	\$	4,700
2 NY	SEG Gas		1,653		2,252		1,346		2,013		1,156
3	Subtotal NYSEG		8,375		11,410		6,819		10,195		5,856
4											
5 RG	&E Electric		6,160		6,853		4,272		3,800		2,027
6 RG	&E Gas		2,469		2,747		1,712		1,523		812
7	Subtotal RG&E		8,629		9,600		5,984		5,323		2,839
8											
9	Total	\$	17,004	\$	21,010	\$	12,803	\$	15,518	\$	8,696

Projects in this category are aimed at building the backbone necessary to enable the Companies to effectively plan, monitor, and control the distribution and transmission systems. These projects include telecommunication infrastructure and automation as well as NY WAN expansion, Energy Control Center (ECC) upgrades. These projects are intended to increase the efficiency in accessing critical systems and information.





Section 6 Other Common Capital Investment Forecast

The combined gas and electric Other Common portfolio is shown for NYSEG and RG&E in Figure 37.

А		В	С		D		E		F
	F	orecast	Forecast	F	Forecast	F	orecast	F	Forecast
\$ in thousands		2020	2021		2022		2023		2024
1 NYSEG Electric	\$	71	\$ 343	\$	26	\$	(182)	\$	217
2 NYSEG Gas		17	84		6		(45)		53
3 Subtotal NYSEG		88	427		32		(227)		271
4									
5 RG&E Electric		100	143		107		107		1,282
6 RG&E Gas		40	57		43		43		514
7 Subtotal RG&E		140	200		150		150		1,796
8									
9 Total	\$	228	\$ 627	\$	182	\$	(77)	\$	2,066

Figure 37. NYSEG and RG&E Total Electric and Gas Other Common Capital Investment Forecast for 2020-2024

Other Common includes minor common projects such as customer service general and laboratory equipment, and a barcode system.

Chapter 7 Bulk Electric System ("BES")

Section 1 Description

The objective of the NYSEG/RGE Bulk Electric System (BES) program is to identify and address system needs on the portion of the BES owned by NYSEG or RG&E in compliance with mandatory reliability standards. The criteria and system performance





requirements for the BES are provided in the North American Electric Reliability Corporation's (NERC) standard TPL-001¹. Each transmission owner has an obligation to demonstrate through planning studies that its portion of the BES meets all mandatory NERC requirements. In cases where unacceptable reliability performance is detected, a documented Corrective Action Plan showing how these deficiencies will be mitigated must be developed.

Section 2 Scope

The proposed transmission system upgrades associated with this program are intended to improve the reliability of the BES in compliance with NERC TPL-001 performance requirements using load forecast levels matching the NYISO's 2018 Load and Capacity Data or "Gold Book" document.

Section 3 Justification

Although the primary focus of this program is to address BES reliability deficiencies, some of the recommended solutions have also been designed to mitigate asset condition² and local³ reliability deficiencies at the same substation locations where significant BES upgrades are being recommended. This approach ensures that a comprehensive and cost effective solution is developed.

https://www.nerc.com/files/TPL-001-4.pdf



¹ Standard TPL-001-4 is the latest effective version of the NERC Transmission System Planning Performance Requirements and is applicable to the Bulk Electric System and may be found at:

² Asset condition upgrades may include a broad range of deficiencies including obsolete or unsupported equipment at or near its end of life, high flood exposure risk, poor operating history.

³ The local system is predominantly referred to as the sub-transmission system (i.e. transmission operating below 100kV). These local systems are typically evaluated separately through the Local Transmission Plan (LTP) process in NY using generally less stringent criteria than the NERC BES which applies to systems rated at or above 100kV.



Section 4 Cost Summary

The cost projections in this document include 2020-2024 only, while the full BES program is expected to span multiple years with final completion of all projects by 2030. Where possible, the Companies have made efforts to break out asset condition upgrade costs if they are unrelated to, or perhaps not otherwise addressed by other NERC TPL-001 reliability upgrades.

Chapter 8 Reforming the Energy Vision ("REV")

Section 1 Description

The projects and programs in this category are designed to advance the New York State Public Service Commission's ("Commission") objectives set forth in Case 14-M-0101 – Reforming the Energy Vision ("REV") and similar proceedings.

Section 2 Justification

The Companies' REV and REV-related initiatives include projects related to: the Companies assuming the role of the Distributed System Platform ("DSP") provider; energy storage; electric vehicles; non-wires alternatives and non-pipe alternatives. These initiatives are consistent with New York State's energy goals, which currently call for 70% of all electricity used in the State to be generated by renewable sources by 2030, and will allow the Companies to transform their business models to integrate clean energy resources, provide customers with granular information and greater control over their energy usage, and provide market participants with information to make informed investment decisions.





Section 3 Scope

The Companies' 2018 Distributed System Implementation Plan, which was filed with the Commission on July 31, 2018⁴, discusses the Companies' current capabilities and their plan to become the DSP for the Companies' customers and Distributed Energy Resources ("DER") Operators⁵. It includes a roadmap over the next five years to invest in key systems, technologies and projects to modernize the grid, and enable DER integration and future market development. These investments will facilitate the core DSP functions, which include:

- 1) *Integrated System Planning* The purpose of the integrated system planning is to:
 - a) Maintain a safe, reliable, resilient network by making investments in distribution facilities and/or connecting new DER;
 - b) Deliver value to customers over the long-term by enabling efficient investment decisions by the Companies and DER developers;
 - c) Accommodate high levels of DER penetration, maximizing the contribution to customer value for any given amount, type, and location of DER;
 - d) Communicate system information and insights to DER developers to inform their investment decisions; and
 - e) Provide system information and insights to other Company functions to support their respective DSP responsibilities.



⁴ Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, 2018 Distributed System implementation Plan (July 31, 2018) ("DSIP").

⁵ DER is used to describe a wide variety of distributed energy resources, including end-use energy efficiency, demand response, distributed storage, and distributed generation. Case 14-M-0101, Order Adopting Regulatory Policy Framework and Implementation Plan (Feb. 26, 2015).



Over the next five years, the Companies plan to improve their models and the quality of data inputs by leveraging more granular customer usage, DER production, and operational performance data as they become available to perform more accurate and reliable planning studies.

- 2) Distribution Grid Operations Grid Operations is the core DSP function that monitors and operates the distribution grid to provide safe, reliable, and resilient distribution service. As noted in 2018 DSIP filing, the Companies are automating 15 distribution circuits and 4 substations and upgrading line and substation equipment with the latest intelligent distribution assets to provide real time data that allows for remote monitoring and control from our Energy Control Center.
- 3) Market Services The Companies plan to develop a Data Sharing Portal to securely transmit: a) Aggregated Anonymized Whole Building Usage Data Requests to appropriately authorized parties; and b) other Aggregated and Anonymized Customer Usage Data to appropriately authorized parties which will be useful to third-party marketplace participants for planning and developing all types of DER.
- 4) Technology Platform Certain technology investments are foundational because they support all three main DSP functions listed above (i.e., Integrated Planning, Grid Operations and Market Services). The Companies' Technology Platform includes load modifying technologies, such as energy storage, electric vehicles, and energy efficiency, which are critical to realizing the State's REV goals regarding decarbonization.





Chapter 9 Advanced Metering Infrastructure ("AMI")

Section 1 Description

The projects and programs in this category are designed to roll out Advanced Metering Infrastructure ("AMI") in the Companies' service territory. AMI is defined as an integrated system of smart meters, communication networks, and data management systems that enables two-way communications between utilities and customer locations, and provides granular, time-sensitized information about customer usage in support of customer options.

Section 2 Justification

Because the quantified benefits of AMI are projected to far exceed its costs, the deployment of AMI is in the best interest of customers, the Companies and New York State. Analysis shows that the operational business savings from deploying AMI for NYSEG and RG&E combined, in the form of reductions in capital and operating costs, exceed the full costs of the AMI system. In addition to these net operational benefits, AMI provides a platform for achieving very significant societal benefits by reducing customer outage costs, reducing carbon emissions, avoiding generation, transmission and distribution investments, and reducing fuel costs.

Section 3 Scope

AMI will include: a) installation of approximately 1.9 million smart devices comprised of new electric meters and modules to be retrofitted on existing gas meters; b) support of a telecommunications network that will include diverse media solutions (i.e., radio frequency, cell, dark fiber, equipment etc.); and c) availability of an information





technology infrastructure and software applications to process data and interact with field devices.

In addition, the network will provide a telecommunications channel for Distributed Energy Resources and Demand Response and will enable the DSP to provide granular data, visibility, and situational awareness to customers, third party market participants.

Chapter 10 Resiliency Plan

Section 1 Description

The projects and programs in this category are designed to enhance the resiliency of the Companies' distribution network where resiliency is defined as (1) preventing and limiting the scope and impact of outages when they occur, and (2) the ability to restore power expediently after a significant outage. Thus, resiliency is both the ability of a system to withstand forces that could potentially cause damage, as well as, the ability to limit the impact of and restore service when damage is experienced. It addresses outages that are caused by storms as well as non-storm events (e.g., a hazard tree falling from outside of our right-of-way on electric infrastructure).

Section 2 Justification

The Resiliency Plan responds to the number of storms of all types and severity that NYSEG and RG&E have experienced over the past decade and to prepare for the potential that New York will experience more intense and more frequent storms. NYSEG and RG&E have concluded that it is necessary to enhance the resiliency of





electric distribution system at this time in order to reduce the costs imposed on customers by long outages and expensive restoration efforts.

Section 3 Scope

Capital expenses to enhance resiliency are categorized as either "Hardening" or "Topology, with Automation":

- Hardening of infrastructure (e.g., poles, crossarms, wires, etc.) throughout NYSEG and RG&E's service territories by using more robust construction practices and materials in compliance with AVANGRID's recently developed Distribution Resiliency Guide.
- Changes to the topology of circuits through a circuit-specific combination of actions including upgrading lines, increasing feeder ties and switching capabilities (with automation), and enabling further segmentation of circuits during outages to limit the number of customers that are impacted by a particular outage. The plan takes a holistic approach that considers more aggressive vegetation management along with these capital expenditures. Automation involves the installation of SCADA switches and reclosers to segment long circuits into multiple sections that can be isolated automatically in order to limit the number of customers that lose power, and also increase the speed of restoring power.

Section 4 Cost Summary

The capital costs for the five years 2020-2024 associated with the Resiliency Plan are presented in Figures 8 and 9 of Chapter 4, Section 4 in this document.





Chapter 11 Non-wires Alternative Projects

Section 1 Description

Non-Wire Alternative ("NWA") projects allow utilities to defer or avoid conventional infrastructure investments in "wires" by procuring distributed energy resources ("DER") that lower costs and emissions while maintaining or improving system reliability. The implementation of NWA projects is an important objective of the New York State Public Service Commission's Reforming the Energy Vision proceeding.

The Companies' strategy for NWA projects is to: 1) build a portfolio of projects which are cost effective for customers and provide reliable alternatives to traditional capital investment projects; 2) comply with regulatory directives; and 3) learn from and work cooperatively with other utilities and stakeholders.

Section 2 Justification

NWA projects benefit both the Companies and customers as they replace, defer or delay traditional capital-intensive projects and infrastructure with customer-sited DER and other market-based solutions. NWAs also serve the public interest because they can provide cost savings and environmental benefits for customers while maintaining system reliability and resiliency.

Section 3 Scope

The Companies currently are planning the following NWA projects to defer traditional wires solutions:





- Stillwater Substation Transformer Upgrade and Voltage Conversion Stillwater Substation, located in NYSEG's Mechanicville Division, is a 2.8 MVA substation transformer that has been near or over its nameplate rating. The traditional wires project is to upgrade the substation with a new 34.5-4.8 X 12.5 kV, 10/12.5 (14) MVA LTC transformer and convert approximately two miles of distribution circuit to 12.5 kV. This NWA project is proposed to defer the planned traditional wires solution for a period of ten years.
- 2) Java Project This proposed project will defer planned traditional wires solution at the NYSEG Java substation for a period of seven years. There are two projects involved. One project will be a peak shaving resource to reduce the peak loading on the transformer bank below its nameplate rating of 5 MVA and will be owned by a 3rd party. The second project involves a micro-grid to address failure of the existing transformer and will be owned by NYSEG.
- Additional Projects NYSEG and RG&E is continuing to identify and pursue additional NWA projects as appropriate.





NYSEG and RG&E / INVESTMENT PLANNING / FIVE YEAR PLAN

Appendix A: Expanded Capital Investment Forecast 2020-2024





Exhibit 1 NYSEG Electric, Generation and Common Capital Investment Forecast Forecast

A		В		С		D		E		F
	F	orecast	F	orecast	Fo	recast	F	orecast	F	orecast
\$ in thousands		2020		2021	2	022		2023		2024
Customer										
New Connections	\$	20,182	\$	20,461	\$	21,056	\$	21,670	\$	23,202
State & Municipal		4,081		4,203		4,329		4,459		4,593
Customer Lighting		6,306		6,495		1,625		1,674		1,724
Total Customer		30,569		31,159		27,011		27,803		29,519
Capacity										
Substations New & Upgrades		20,685		39,489		58,871		80,012		57,805
Large Capacity Projects		6,674		-		-		-		-
Non-wire Alternative (NWA)		1,328		846		865		883		265
Total Capacity		28,688		40,335		59,735		80,895		58,070
Asset Condition, Reliability, Resiliency										
Substation Rebuilds & Replacements		48.571		53.438		61.015		43.899		67.054
Betterments		10,115		10.328		10.545		10.766		11.352
Transformer Replacement		2,463		1,593		2,690		7,110		14,550
Distribution Line Inspection Replacements		12 731		13 113		13,506		13 911		14 329
Conductor Replacement		66 033		56 757		96 782		133 273		141 203
Resiliency Plan		19 895		24 640		30,600		31,960		45 000
Other Asset Condition Reliability Resiliency		38		21,010		-		-		-
Total Asset Condition, Reliability, Resiliency		150 8/6		150 860		15 138		2/0 010		203 /87
Total Asset Condition, Reliability, Resilency		159,040		159,009		215,150		240,919		293,407
Sustam Operations										
Operations		1 690		1 725		1 700		1 020		1 000
Operations Storm Destantion		1,009		1,735		1,702		1,030		1,000
Tatal Sustam Operations		1.00		0.000		010		035		004
Total System Operations		2,269		2,333		2,398		2,405		2,534
O secoli se se										
<u>Compliance</u>		50 400		07.000				10.001		
BES		52,132		97,339		85,246		49,301		116,354
NERC Alert		9,108		9,108		9,108		9,108		11,436
Total Compliance		61,240		106,447		94,354		58,409		127,790
Modernization										
Business Systems		200		203		206		209		5,909
AMI		42,663		83,971		62,382		51,223		13,702
DSIP		52,209		70,105		63,822		52,256		61,255
Energy Smart Community		843		283		-		-		223
Total Modernization		95,915		154,562	1	126,410		103,688		81,089
Generation										
Generation Asset Condition		9,552		4,291		4,620		3,774		5,241
Generation System Operations		1,500		1,500		1,500		1,500		1,500
Total Generation		11,052		5,791		6,120		5,274		6,741
Common (1)										
Information Technology		18 979		21 811		17 183		17 979		18 396
Fleet		12 383		18 901		10.889		5 637		14 672
Facilities		2 355		2 828		7 508		3 501		0 156
Security		14 911		18 710		27 205		0,007		6 836
Operational Technology		6 722		0.157		21,290 5 470		9,09Z		4 700
Operational Technology Other Common		0,122		3,137		0,413		0,103		4,700
		/1		343		26		(182)		217
rotal Common		oo,320		/1,/60		00,374		44,299		53,978
Total Oracital Francis disea	*	444.000	<u>_</u>	F70 055	•		<u>_</u>	500 755	¢	050 000
Iotal Capital Expenditures	\$	444,899	\$	572,255	\$ 5	540	\$	563,752	\$	653,208

56 Amounts may not add due to rounding

57 (1) Represends Electric allocation of Common Expenditures of 80.26%





Exhibit 2 RG&E Electric and Common Capital Investment Forecast





	А	В		С	D	Е		F
		Forecast	F	orecast	Forecast	Forecast	F	orecast
1	\$ in thousands	2020		2021	2022	2023		2024
2	Customer							
3	New Connections	\$ 9,809	\$	9,786	\$ 10,070	\$ 10,463	\$	11,165
4	State & Municipal	1,373		1,402	1,431	1,461		1,491
5	Customer Lighting	971		1,000	580	597		615
6	Total Customer	12,153		12,187	12,081	12,521		13,271
7								· · · · ·
8	Capacity							
9	Substations New & Upgrades	31.667		29.298	42.999	18.920		29.709
10	Large Capacity Projects	104.378		5.877	-	-		-
11	Total Capacity	136.045		35,175	42,999	18,920		29,709
12				00,0	.2,000	10,020		20,100
13	Asset Condition Reliability Resiliency							
14	Substation Rebuilds & Replacements	50 925		26 112	1/ 8/5	25 680		30 318
15	Bottormonts	4 153		4 279	4 406	1 539		4 674
10	Transformer Benlessment	4,155		4,270	4,400	4,000		4,074
10	Distribution Line Inspection Deplecements	14,057		14,944	13,959	10,402		2 005
17	Distribution Line inspection Replacements	2,052		2,732	2,014	2,090		2,900
18		56,904		63,088	84,739	66,843		40,530
19	Resiliency Plan	6,670		8,260	10,200	10,540		17,000
20	Other Asset Condition, Reliability, Resiliency	6,043		4,921	6,638	2,509		4,454
21	Total Asset Condition, Reliability, Resiliency	141,403		124,665	137,601	129,419		120,134
22								
23	System Operations							
24	Operations	429		440	452	463		476
25	Storm Restoration	341		351	362	373		384
26	Total System Operations	770		791	813	836		860
27								
28	Compliance							
29	BES	12,210		20,171	14,433	8,097		35,233
30	NERC Alert	1,000		1,000	1,000	1,000		1,981
31	Total Compliance	13,210		21,171	15,433	9,097		37,214
32								
33	Modernization							
34	Business Systems	40		41	41	42		1,238
35	AMI	19.070		34.653	24.776	22.149		5.921
36	DSIP	8.323		9.153	8.652	5.304		8.016
37	Total Modernization	27,432		43.846	33,469	27,495		15,175
38				,	,			
39	Generation							
40	Generation Asset Condition	1 125		1 650	1 525	3 725		4 975
41	Generation Capacity	6 348		15 113	10 953	7 600		11 800
12	Generation System Operations	1 500		1 550	2 250	2 250		1 550
13	Total Generation	8 973		18 313	14 728	13 575		18 325
43		0,975		10,010	14,720	10,070		10,020
44	Common (1)							
40		=						
46	Information Technology	5,302		6,129	5,456	8,029		8,214
47	Fleet	3,257		3,320	3,389	3,464		4,117
48	Facilities	2,507		1,757	2,792	3,042		4,930
49	Security	7,372		8,712	10,013	4,105		3,050
50	Operational Technology	6,160		6,853	4,272	3,800		2,027
51	Other Common	100		143	107	107		1,282
52	Total Common	24,698		26,914	26,029	22,547		23,621
53			_				_	_
54	Total Capital Expenditures	\$ 364,683	\$	283,063	\$ 283,153	<u>\$ 234,4</u> 10	\$	258,308
55								
56	Amounts may not add due to rounding							
57	(1) Represents Electric allocation of Common Exp	enditures of	71.3	9%				





Exhibit 3 NYSEG Gas and Common Capital Investment Forecast

	Α		В		С		D		Е		F	
		Forecast		F	Forecast		Forecast		Forecast		Forecast	
1	\$ in thousands		2020		2021		2022		2023		2024	
2	Customer											
3	New Installations	\$	8,606	\$	7,300	\$	7,447	\$	7,597	\$	7,749	
4	State & Municipal		2,063		4,087		4,171		4,257		4,346	
5	Meters and Regulators		2,817		2,323		2,730		3,137		4,400	
6	Total Customer		13,486		13,710		14,348		14,991		16,495	
7												
8	Asset Condition & Reliability											
9	Leak Prone Main Replacement		34,870		36,591		51,328		37,080		38,556	
10	Regulators and Gate Stations		6,024		3,024		3,024		3,024		3,024	
11	Distribution Main Replacements		22,690		4,244		3,299		3,356		2,913	
12	Transmission Main Replacements		132		-		-		-		-	
13	System Reliability		1,475		3,100		2,300		3,500		5,083	
14	Other Asset Condition		970		991		1,011		1,033		1,055	
15	Total Asset Condition & Reliability		66,161		47,951		60,963		47,993		50,631	
16												
17	Modernization											
18	Business Systems		5,800		5,325		2,500		2,000		-	
19	AMI		10,534		21,668		16,409		12,925		3,502	
20	Total Modernization		16,334		26,993		18,909		14,925		3,502	
21												
22	Common (1)											
23	Information Technology		4,626		5,331		4,192		4,387		4,525	
24	Fleet		3,045		4,649		2,678		1,386		3,609	
25	Facilities		579		696		1,846		883		2,252	
26	Security		3,643		4,604		6,713		2,236		1,681	
27	Operational Technology		1,653		2,252		1,346		2,013		1,156	
28	Other Common		17		84		6		(45)		53	
29	Total Common		13,564		17,616		16,782		10,860		13,276	
30												
31	Total Capital Expenditures	\$	109,545	\$	106,270	\$ 1	11,002	\$	88,769	\$	83,903	
32												

33 Amounts may not add due to rounding

34 (1) Represents Gas allocation of Common Expenditures of 19.74%





Exhibit 4 RG&E Gas and Common Capital Investment Forecast

	А		В		С	D		E		F		
		Forecast		Forecast		Forecast		Forecast		Forecast		
1	\$ in thousands		2020		2021		2022		2023		2024	
2	Customer											
3	New Installations	\$	6,534	\$	10,050	\$	7,702	\$	7,857	\$	7,912	
4	State & Municipal		640		3,146		3,209		3,274		3,288	
5	Meters and Regulators		2,150		2,199		2,360		2,665		4,070	
6	Total Customer		9,325		15,395		13,271		13,796		15,269	
7	-											
8	Asset Condition & Reliability											
9	Leak Prone Main Replacement		26,162	26,678		26,704		27,241		27,788		
10	Regulators and Gate Stations		3,185		3,998		4,079		6,161		22,245	
11	Distribution Main Replacements		976		996		1,016		1,036		1,057	
12	Transmission Main Replacemer		8,199		21,000		23,500		4,500		7,500	
13	System Reliability		730		6,650		7,150		7,700		4,000	
14	Other Asset Condition		473		478		484		490		496	
15	Total Asset Condition & Relia		39,726		59,801		62,933		47,128		63,086	
16	-											
17	Modernization											
19	AMI		8,024		19,098		16,253		14,082		3,840	
20	Total Modernization		8,024		19,098		16,253		14,082		3,840	
21												
22	<u>Common (1)</u>											
23	Information Technology		2,125		2,456		2,187		3,218		3,292	
24	Fleet		1,305		1,331		1,358		1,388		1,650	
25	Facilities		1,004		704		1,119		1,219		1,976	
26	Security		2,954		3,492		4,013		1,645		1,222	
27	Operational Technology		2,469		2,747		1,712		1,523		812	
28	Other Common		40		57		43		43		514	
29	Total Common		9,898		10,786		10,431		9,036		9,466	
30	-											
31	Total Capital Expenditures	\$	66,972	\$	105,080	\$	102,889	\$	84,043	\$	91,662	
32												
33	Amounts may not add due to re	oun	ding									
34	(1) Represents Gas allocation of Common Expenditures of 28.61%											




Exhibit 5 NYSEG Combined Electric and Gas Common Capital Investment Forecast

	A		В		С		D		Е		F
		F	orecast	Fo	precast	F	orecast	F	orecast	F	orecast
	\$ in thousands		2020		2021		2022		2023		2024
1	Electric (1)										
2	Information Technology	\$	18,979	\$	21,811	\$	17,183	\$	17,979	\$	18,396
3	Fleet		12,383		18,901		10,889		5,637		14,672
4	Facilities		2,355		2,828		7,508		3,591		9,156
5	Security		14,811		18,719		27,295		9,092		6,836
6	Operational Technology		6,722		9,157		5,473		8,183		4,700
7	Other Common		71		343		26		(182)		217
8	Electric Subtotal		55,320		71,760		68,374		44,299		53,978
9											
10	<u>Gas (2)</u>										
11	Information Technology		4,626		5,331		4,192		4,387		4,525
12	Fleet		3,045		4,649		2,678		1,386		3,609
13	Facilities		579		696		1,846		883		2,252
14	Security		3,643		4,604		6,713		2,236		1,681
15	Operational Technology		1,653		2,252		1,346		2,013		1,156
16	Other Common		17		84		6		(45)		53
17	Gas Subtotal		13,564		17,616		16,782		10,860		13,276
18											
19	Total Common										
20	Information Technology		23,605		27,142		21,375		22,366		22,921
21	Fleet		15,428		23,550		13,567		7,023		18,281
22	Facilities		2,934		3,524		9,354		4,474		11,408
23	Security		18,454		23,323		34,009		11,328		8,518
24	Operational Technology		8,375		11,410		6,819		10,195		5,856
25	Other Common		. 88		427		32		(227)		271
26	Total common	\$	68,884	\$	89,375	\$	85,156	\$	55,160	\$	67,253
27		<u> </u>	,		, -	-	, -		, -		

2728 Amounts may not add due to rounding

29 (1) Represents Electric allocation of Common Expenditures of 80.26%

30 (2) Represents Gas allocation of Common Expenditures of 19.74%





Exhibit 6 RG&E Combined Electric and Gas Common Capital Investment Forecast

	А	B Forecast	C Forecast	D Forecast	E Forecast	F Forecast
	\$ in thousands	2020	2021	2022	2023	2024
1	Electric (1)					
2	Information Technology	5,302	6,129	5,456	8,029	8,214
3	Fleet	3,257	3,320	3,389	3,464	4,117
4	Facilities	2,507	1,757	2,792	3,042	4,930
5	Security	7,372	8,712	10,013	4,105	3,050
6	Operational Technology	6,160	6,853	4,272	3,800	2,027
7	Other Common	100	143	107	107	1,282
8	Electric Subtotal	24,698	26,914	26,029	22,547	23,621
9						
10	<u>Gas (2)</u>					
11	Information Technology	2,125	2,456	2,187	3,218	3,292
12	Fleet	1,305	1,331	1,358	1,388	1,650
13	Facilities	1,004	704	1,119	1,219	1,976
14	Security	2,954	3,492	4,013	1,645	1,222
15	Operational Technology	2,469	2,747	1,712	1,523	812
16	Other Common	40	57	43	43	514
17	Gas Subtotal	9,898	10,786	10,431	9,036	9,466
18						
19	Total Common					
20	Information Technology	7,427	8,585	7,643	11,246	11,506
21	Fleet	4,562	4,651	4,747	4,853	5,767
22	Facilities	3,511	2,461	3,911	4,261	6,906
23	Security	10,326	12,204	14,026	5,751	4,272
24	Operational Technology	8,629	9,600	5,984	5,323	2,839
25	Other Common	140	200	150	150	1,796
26	Total Common	34,595	37,700	36,461	31,583	33,087
27						

28 Amounts may not add due to rounding

29 (1) Represents Electric allocation of Common Expenditures of 71.39%

30 (2) Represents Gas allocation of Common Expenditures of 28.61%





NYSEG and RG&E / INVESTMENT PLANNING / FIVE YEAR PLAN

Appendix B: Capital Project Summaries and Forecast 2020-2024





NYSEG	
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Betterments

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

The Betterments program replaces various distribution system elements that contribute to high SAIFI measures. These projects focus on the reliability, operability and flexibility of the electric distribution system.

Reasons and Benefits:

Electric Betterments projects are focused on improving reliability of worst performing distribution circuits and maintaining delivery of electricity to our customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$103,203

2015	2016	2017	2018	2019
\$14,215	\$10,674	\$6,449	\$7,622	\$11,137
2020	2021	2022	2023	2024
\$10,115	\$10,328	\$10,545	\$10,766	\$11,352





NYSEG

Substation Minor Capital

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric

Responsible Group: Electric Ops

Scope:

Substation Minor Capital includes various work at substations such as bus covers, fence/battery replacements, recloser change outs, etc. under the \$200K threshold for a major project.

Reasons and Benefits:

The projects under this program replace and maintain safety, reliability and efficiencies within substations for small projects.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$66,345

2015	2016	2017	2018	2019
\$11,974	\$6,650	\$6,656	\$3,721	\$9,807
2020	2021	2022	2023	2024
\$7,147	\$7,252	\$3,749	\$3,451	\$5,937





NYSEG Distribution Line

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops
Scope:	

The Distribution Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric distribution system.

Reasons and Benefits:

This program maintains a reliable distribution system.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$230,073

2015	2016	2017	2018	2019
\$12,317	\$18,600	\$17,432	\$23,061	\$44,680
2020	2021	2022	2023	2024
\$21,469	\$22,113	\$22,777	\$23,460	\$24,164





NYSEG

Distribution Line Inspection Repairs

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

The Distribution Line Inspection Repair program provides for the repair and replacement of assets required as a result of the Distribution Line Inspection program. The program alleviates potential reliability concerns proactively before system performance is affected. This program commonly replaces defective cross-arms, poles, cutouts, transformers, insulators, splices, etc.

Reasons and Benefits:

This program proactively replaces assets before system reliability is impacted by failure of system elements. This maintains reliable service to our customers that if not performed could lead to long outages and reduced system performance.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$135,606

2015	2016	2017	2018	2019
\$9,288	\$11,840	\$8,899	\$13,381	\$24,608
2020	2021	2022	2023	2024
\$12,731	\$13,113	\$13,506	\$13,911	\$14,329





NYSEG

Homer City Capital Breakers

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

This project involves replacement of breakers, LAs, CCVTs, RTU, Security Systems, Disconnect Switches, Backup Relaying, Battery and Battery Chargers.

Reasons and Benefits:

This project upgrades systems due to end of life or failures associated with mechanical, electrical, gas leaks along with the availability of support are key drivers. This project will increase operating capacity and increase reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$15,206

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$6,257	\$3,639	\$5,310	\$0	\$0





NYSEG

Substation Battery Replacement Program

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

This program replaces Very Poor Health Index batteries, as identified by Maintenance Engineering and Asset Management review, at various NYSEG substations.

Reasons and Benefits:

To reduce the risk of failure and the subsequent negative impact on substation operational capability, these critical components are replaced when they have reached the end of their useful life.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,954

2015	2016	2017	2018	2019
\$0	\$1,122	\$807	\$725	\$990
2020	2021	2022	2023	2024
\$1,020	\$1,041	\$1,062	\$1,083	\$1,105





NYSEG Substation Circuit Breaker Replacement Program

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Electric Ops

Scope:

This program replaces substation circuit breakers that have been identified as poor and very poor as identified by Asset Management as well as those breakers that have been identified as overdutied by Engineering.

Reasons and Benefits:

This program maintains a safe and reliability network and reduces the risk of damage to substation elements.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$142,811

2015	2016	2017	2018	2019
\$0	\$1,884	\$8,662	\$25,036	\$17,100
2020	2021	2022	2023	2024
\$17,316	\$17,664	\$18.019	\$18,381	\$18,750





NYSEG

Transmission Line

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

The Transmission Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric transmission system.

Reasons and Benefits:

This program maintains a reliable transmission system and addresses transmission line inspection deficiencies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$129,757

2015	2016	2017	2018	2019
\$4,991	\$6,524	\$9,300	\$13,913	\$10,542
2020	2021	2022	2023	2024
\$15,914	\$16,391	\$16,883	\$17,389	\$17,911





NYSEG

Bulkhead - Replace Transformer Bank #2 & #1

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

This project upgrades the existing 5 MVA 34.5-4.8 kV Bank#1 Transformer and 9.3 MVA LTC 34.5-12.47 kV Bank #2 Transformer to two 20/26/33(37.3) MVA LTC, 34.5-12.47 kV transformers, with provisions for six 12.47 kV distribution circuit position.

Reasons and Benefits:

The project will improve segment conditions and improve reliability at the Bulkhead substation

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$14,135

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$565	\$3,392	\$10,177





NYSEG Line 879 Rebuild - Ausable Town Line to Rainbow Falls

Asset Condition	, Reliability and	Resiliency
	Asset Condition	Asset Condition, Reliability and

Business Area: Electric

Responsible Group: Projects

Scope:

The project scope includes the rebuild of the 46kV, Hammond Lane to Rainbow Falls through Hammond Lane including Peru Tap (and section from Main 879 L to Arizona Ave Sub). This 46kV rebuild has six sections to it and totals 16.5 miles. The requirements for the new construction includes single pole tangent framing standard to be used throughout the project. All angle structures, angle dead-ends and 3-way dead-ends are to be steel poles with caisson foundations. The new conductor is 477 kcmil ACSR 18/1, and static will be 36 fiber optical ground wire (OPGW) cable for all rebuild areas.

Reasons and Benefits:

The line was ranked as poor in a prior year assessment. Specific issues driving the poor assessed condition included indications of very poor conductor, cross arms, and braces as well as poor splices and dead-end assemblies and a lot of insulator glazing deterioration. The conductor in some of these segments has an average age of 81 years and many of the poles are from the 1930's to the 1950's. These sections of Line 879-880 affect about 5,000 customers; many of these are key municipal, commercial, and industrial loads in the area.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$22,832

2015	2016	2017	2018	2019
\$0	\$268	\$373	\$866	\$14,199
2020	2021	2022	2023	2024
\$7,127	\$0	\$0	\$0	\$0





NYSEG Line 347 - 34.5 kV

Category:	Asset Condition,	Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

Reconductor the 2.75 miles from Maplewood to Kiamesha to obtain an LTE rating of 40MVA. Reconductor the 3.1 miles of the 347 line from Coopers Corners to Maplewood to obtain an LTE rating of 60MVA

Reasons and Benefits:

Increase system capacity.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,250

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$158	\$263	\$1.575	\$3.255





NYSEG

Line 348 - 34.5 kV

Category:	Asset Condition, Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild/reconductor the Ferndale to Liberty 348 line with 477 or equivalent conductor.

Reasons and Benefits:

Increase system capacity.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,250

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$158	\$263	\$1.575	\$3.255





NYSEG Line 560 - 34.5 kV

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects
Scope:	
The Line 560 Border City	v to Waterlee will be reconductored and the st

The Line 560 Border City to Waterloo will be reconductored and the static line and appurtenances will be replaced.

Reasons and Benefits:

This line assessed as poor has been recommended for intervention . The 336 ACSR conductor is 85 years old; static wire and static wire attachments were identified to be in very poor condition.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,400

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$252	\$420	\$2,520	\$5,208





NYSEG Line 561 - 34.5 kV

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

Full rebuild-of Line 561 Waterloo to SenecaFalls. The project will replace the static conductor, static line and repair steel structures.

Reasons and Benefits:

This line segment was assessed as being in poor condition in the 2018 Overhead Transmission Line Risk Assessment. The static line and tower have been reported to be in poor condition. Steel structures and conductor are 90 years old; tower plates were noted to be in poor condition; static wire attachments were noted to be in very poor condition; The segment needs reinforcement to accommodate OPGW.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,250

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$248	\$413	\$2,475	\$5,115





NYSEG

Line 589 34.5kV Rebuild

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild the structures and reconductor Line 589 from Hall to Naples Substations.

Reasons and Benefits:

Gorham to Rushville segment was rated poor - 48.4% in the 2018 Transmission Line Assessment by Asset Management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$20,775

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$831	\$1,247	\$8,310	\$10,388





NYSEG Line 593 34.5kV Rebuild

Cataoraria			
Category:	Asset Condition,	Reliability	y and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild the structures and install a static line on Line 593 from St. Johns to Keuka Substations.

Reasons and Benefits:

Porters Corners to Keuka segment was rated poor - 36.3% in the 2018 Transmission Line Assessment by Asset Management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,045

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$438	\$657	\$4,380	\$6,570





NYSEG Line 626

Category: Asset Condition, Reliability and Re	esiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild/reconductor the Comstock to Franchise Line portion of the 625/626 line with 477 or equivalent conductor.

Reasons and Benefits:

Increase system capacity.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,636

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$149	\$248	\$1 485	\$3,755	





NYSEG

Line 802 Brewster 46 kV Rebuild

Category: Asset Condition, Reliability and Res
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Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild Line 802 from Carmel to Croton Falls Substations. The rebuild will include replacing certain knee braces, individual poles, conductor appurtenances and the static wire. Additionally, improvement to access to this line will be included in the project.

Reasons and Benefits:

The two L802 segments between Carmel and Croton Falls assessed as poor and have been recommended for intervention. Knee braces, poles, conductor appurtenances and static wire were identified as being in poor condition and need to be replaced. This is difficult to access and faults on the line would require time consuming access and potentially long outages.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$6,353

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$231	\$347	\$2,310	\$3,465	\$0





NYSEG Line 802 Oneonta - 46 kV

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild of the Otego to Pierce Avenue segment of L802.

Reasons and Benefits:

The L802 – Otego to Pierce Avenue segment is rated as marginally fair. The primary concerns on this line segment include cross arms generally considered to be in poor condition, no static wire protection, and the poles and conductor reaching end of life. 77% of the conductor on this segment is 1928 vintage 2/0 copper and 57% of the poles are at least 60 years old. There are a dozen open notifications from inspection deficiencies found on this segment. This line segment was rated as "poor" in the 2013 assessment but adjustments in the evaluation algorithm brought the health score slightly above "poor" into "fair" in the 2018 overhead transmission assessment update.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$6,105

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$222	\$333	\$2,220	\$3,330





NYSEG

Line 803 Rebuild - 46 kV - Kent to West Appleton

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Business Area: Electric

Responsible Group: Projects

Scope:

A 2.9 mile rebuild of 46kV Line from the Kent Substation to Tilly Foster substation in the Brewster Division. The project will include the installation of new structures, new 477 kcmil ACSR (18/1) conductor, and a 36-fiber optical ground wire (OPGW).

Reasons and Benefits:

In the 2018 asset management assessment of NYSEG's transmission system, this segment of Line 803 was rated in poor condition. The line has copper conductor that is almost 50 years old, and wood structures that average over 40 years old.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,168

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$297	\$446	\$2,970	\$4,455	\$0





NYSEG

Line 805 Rebuild Wassaic to Ten Mile River

Category:	Asset Condition,	Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild the structures and reconductor the Line 805 from Harlem Valley to Amenia Substations.

Reasons and Benefits:

Wassaic to Amenia segment was rated poor - 43.7% in the 2018 Transmission Line Assessment by Asset Management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,488

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$345	\$518	\$3,450	\$5,175	\$0





NYSEG Line 807 - 46 kV - Katonah Tap to Bedford Hills

Category:	Asset Condition.	Reliabilit	v and Resiliency	/
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Business Area: Electric

Responsible Group: Projects

Scope:

Partial Rebuild-Katonah Tap to Bedford Hills.

Reasons and Benefits:

This line was assessed as being in poor condition and has been recommended for intervention. Xarms, braces and insulators were identified as being in poor condition and need to be replaced.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,250

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$158	\$263	\$1,575	\$3,255





NYSEG

Line 807 Rebuild - 46 kV - South New Berlin to New Berlin

Category:	Asset Condition, Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild the structures and reconductor Line 807 from South New Berlin to New Berlin Substations.

Reasons and Benefits:

South New Berlin to New Berlin segment was rated poor - 49.1% in the 2018 Transmission Line Assessment by Asset Management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,950

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024





NYSEG

Line 810 Brewster 46 kV Rebuild

Category:	Asset Condition, Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild line from Carmel to Croton Falls Substations.

Reasons and Benefits:

Line rated in fair condition in 2018 Transmission Line Assessment by Asset Management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$18,893

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$687	\$1.031	\$6.870	\$10,305	





NYSEG Line 810 Oneonta - 46 kV

Category: Asset Condition, Reliability and Resilience

Business Area: Electric

Responsible Group: Projects

Scope:

Line 810 is a 46kV transmission line rebuild from the East Norwich substation to the Oxford substation. The project is in the Oneonta Division of NYSEG. The rebuild will include installation of new structures with new 477 ACSR conductors. The rebuild will also include the addition of OPGW on the line. This rebuild will have a length of 6.2 miles.

Reasons and Benefits:

Prior year assessment ranked the East Norwich to Oxford section of Line 810 as 'very poor.' The asset has a large number of splices. Cross arms and braces were ranked as 'very poor' and woodpecker damage was described as severe. The poles are very old and rotting. Splices, suspension clamps and dead-end assembly were in 'very poor' condition. 75% of the conductor and 50% of the poles were installed in 1929 and asset management recommended to rebuild this segment in 2018. The current proposed project is to rebuild the portion of this segment that has copper conductor and is in the poorest condition (from where it crosses Route 12 south to the Oxford substation).

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,550

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$257	\$428	\$2,565	\$5,301





NYSEG Line 880 Rebuild

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

The Line 880 Rebuild Project will rebuild the 15.4 miles of 46kV line from the Rainbow Falls Substation to the Cabot Substation.

Reasons and Benefits:

Line 880 has been identified by Asset Management as a line that needs replacement. The 15.4 miles of 46kV line from the Rainbow Falls Substation to the Cabot Substation provide services for 2300 customers in the area. There is presently no static wire existing for this line. Without a static wire, this line is presently at higher risk for lighting related outages and does not meet AVANGRID's standards for lightning protection. The Line's poles have also been rated in from poor to fair condition, with the many of the poles being installed between 1947 and 1950 with an average age of 51 years.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$18,311

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$49	\$793
2020	2021	2022	2023	2024
\$6,948	\$6,987	\$3,535	\$0	\$0





NYSEG Line 890 Rebuild

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Proiects

Scope:

Line 890 Rebuild Project consists of the rebuilding of 13.1 miles of 46kV lines from the Raquette Lake Substation to the Steamboat Landing Substation, and then on to the Blue Mountain Lake Substation.

Reasons and Benefits:

Line 890 has been identified as being in "Poor" condition with a health score of 42% by Asset Management. This line is a 46kV line that traverses from the Steamboat Landing Substation to the Raquette Lake Substation and provides services for 1,950 Customers in the area. The existing insulators are noted to be deteriorating on the lines and there is presently no static wire existing for this line. Without a static wire, this line is presently at higher risk for lighting related outages and does not meet Avangrid's standards for lightning protection. The poles are an average age of 58 years old, with the majority of the poles being installed in 1955.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$6,920

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$42	\$763
2020	2021	2022	2023	2024
\$3,835	\$2,280	\$0	\$0	\$0





NYSEG Line 962 - 115kV Rebuild

Category:	Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

The Circuit 962 Rebuild consists of rebuilding 38 miles of 115kV transmission line, from Owego to Elmira, NY. And substation work at ~5 substations. The Circuit 962 Rebuild is an Asset Management project. This portion of the circuit has been identified to be in poor overall condition with respect to age, clearance issues, etc. The Circuit 962 Rebuild project consists of rebuilding an approximately thirty five mile long section of the existing 115kV Circuit 962 from South Owego to Elmira, NY. The project will require an Article VII Permit.

Reasons and Benefits:

To improve system capacity. This portion of the circuit has been identified to be in poor overall condition with respect to age, clearance issues, etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$14,729

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$429
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$14,300





NYSEG Line 968 115 kV Rebuild

Category:	Asset Condition,	Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Rebuild line from Greenridge to Meyer Substations.

Reasons and Benefits:

Line rated in fair condition in 2018 Transmission Line Assessment by Asset Management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$88,178

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1.400	\$2.799	\$27,993	\$27.993	\$27.993





NYSEG

New Gardenville Rebuild

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

Project consists of a replacement of the 230kV breakers, the 115kV breakers, the 34.5kV breakers, and the movement of the breakers from Old Gardenville to New Gardenville driven in part by a National Grid initiative. National Grid will pay for the cost of the movement of the 115kV breakers from Old Gardenville. In addition, there will be a land transfer as National Grid wants to own Old Gardenville.

Reasons and Benefits:

230kV Breakers: Asset Management has assessed the 230kV breakers as poor due to several factors including obsolescence and the units being overdutied. In addition, NPCC has mandated that we must convert the 230kV system to separate "A" and "B" systems.

National Grid has upgraded their Gardenville substation 115kV systems necessitating changes to our 115kV system.

National Grid has requested to take ownership of Old Gardenville.

The remaining 115kV breakers have been assessed as poor due to obsolescence and are recommended to be replaced to benefit from synergies. Items 1 and 2 are National Grid funded. 34.5kV Breakers: Asset Management has assessed the 34.5kV breakers as poor due to several factors including obsolescence and that units being overdutied and recommend replacement of these breakers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$44,764

2015	2016	2017	2018	2019
\$143	\$282	\$514	\$612	\$746
2020	2021	2022	2023	2024
\$735	\$12,757	\$20,444	\$8,532	\$0





NYSEG

Northside 115/34.5kV Transformer B1 and B2 Replacement

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Install a new 115/34.5kV Transformer and replace the existing one.

Reasons and Benefits:

New Transformer B1: Thermal overload of Northside 115/34.5 kV Transformer B1 in 2025 upon loss of the Northside 115/34.5kV Transformer B2 or the double-circuit Noyes Island - Glenwood - Oakdale 34.5kV Lines 410/416.Replace Transformer B2: System Normal thermal overload of Northside 115/34.5 kV Transformer B2 in 2013. Thermal overload of Northside 115/34.5kV Transformer B2 in 2013. Thermal overload of Northside 115/34.5kV Transformer B2 in 2013. Thermal overload of Northside 115/34.5kV Transformer B2 above STE rating for loss of the Northside 115/34.5kV Transformer B1.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,621

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$531	\$1.593	\$2.124	\$3.717	\$2,655





NYSEG

Substation Modernization

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric

Responsible Group: Projects

Scope:

This project is a substation rebuild project to replace several distribution substations in NYSEG's territory that have end of life and/or condition issues.

Reasons and Benefits:

This program will increase system capacity and reliability throughout the NYSEG electric system.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$75,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$5,000	\$10,000	\$10,000	\$10,000	\$40,000





NYSEG Resiliency Plan

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Processes & Technology

Scope:

The scope of the Resiliency project is to reduce the impact of severe weather to customers and improve overall SAIFI and CAIDI through 4 categories:

The top 400 circuits have been identified that impact 55% of the SAIFI.

The goal is to have common voltages for better tie points, reducing the number of customers on a circuit.

The project will also provide more automated sectionalizing and protection through automated recloser installations and SCADA switches.

In conjunction the plan is to harden the system by using larger diameter poles, tree aerial cable and, where possible, potentially undergrounding sections.

The goal is to have common voltages for better tie points, reducing the number of customers on a circuit and provide more automated sectionalizing and protection through automated recloser installations and SCADA switches.

Reasons and Benefits:

This program is focused on decreasing the frequency and length of outages experienced by our customers. The program will harden the system and increase the reliability of service to our customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$155,800

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$13,705




2020	2021	2022	2023	2024
\$19,895	\$24,640	\$30,600	\$31,960	\$35,000





NYSEG - Resiliency Large Projects

Category:	Asset Condition,	Reliability and Resiliency
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Business Area: Electric

Responsible Group: Processes & Technology

Scope:

These large projects will support Resiliency. The type of projects include:

- New Substation
- Upgrades Substation
- Upgrade Wire Section of Transmission Circuits
- Voltage Conversion of Circuits
- Upgrade wire section of Distribution Circuits"

Reasons and Benefits:

Avoided customer interruption costs represent the largest benefit stream. When customers experience interruptions, they bear economic costs. The Resiliency Plan investments are designed to reduce the frequency and duration of interruptions and thus deliver economic benefits to customers.

Avoided restoration costs are benefits from restoring power to customers less frequently due to fewer outages in future years. Restoration costs consist of capital and O&M.

Avoided replacement costs are costs that would be incurred for replacing infrastructure in the absence of these projects. These apply to poles for distribution circuits.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$10,000





NYSEG

Carmel Add Second 115/46 kV Transformer

Category:	Capacity

Business Area: Electric

Responsible Group: Projects

Scope:

Install a second 115/46 kV, 30/40/50 MVA, LTC transformer at Carmel Substation and operate it in parallel with the existing 115/46 kV, 30/40/50 MVA LTC transformer.

Reasons and Benefits:

During the 2013 summer peak load period, an outage of the existing 115/46 kV transformer at Carmel Substation would cause the 115/46 kV transformer #2 at Croton Falls to exceed it summer LTE rating. Based on the current Brewster Division summer peak load, 16 MW and 3,100 customers could be exposed.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$24,983

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1,249	\$3,747	\$4,997	\$8,744	\$6,246





NYSEG Coopers Corners, Add Third 345/115kV Transformer

Category:	Capacity
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Business Area: Electric

Responsible Group: Projects

Scope:

Coopers Corners project is to install a third 345/115 kV, LTC transformer rated 120/160/200 MVA, at Coopers Corners Substation and operate it in parallel with the two existing 345/115 kV. 200 MVA. LTC transformers.

Reasons and Benefits:

In 2012, a forced outage of one of the existing 345/115 kV transformers at Coopers Corners Substation with the other 345/115 kV transformer already out of service long term, would cause widespread load shed to the majority of the Liberty Division customers. During 2012, there would be up to 120 MW of load and 32000 customers at risk for potential load shed. Based on the current configuration and operation of the Liberty transmission system, this area would be exposed to this potential problem for the entire 8760 hours of the year.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$73,853

2015	2016	2017	2018	2019
\$149	\$131	\$53	\$1,285	\$1,885
2020	2021	2022	2023	2024
\$5,395	\$11,097	\$15,462	\$28,653	\$9,742



NYSEG Dingle Ridge - Add Second Transformer and 13.2kV Conversion

Category:	Capacity
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Business Area: Electric

Responsible Group: Projects

Scope:

This project will upgrade the current 5MVA transformer bank substation to a new Greenfield substation with two 12/16/20 (22.4) MVA transformer banks. Convert 9.6 miles of 4.8KV circuits (Circuits 277 and 278) to 13.2KV.

Reasons and Benefits:

The current 1667 kVA substation transformer is loaded to 132% of rating (2013 Loading). There are strong ties between the Dingle Ridge substation circuits and Putnam Lake and also with Tilly Foster. Thus a double bank upgrade from 5MVA to two 12/16/20 MVA will maintain in the N-1 redundancy and allow off-loading the overloaded Tilly Foster, Putnam Lake and Peach Lake circuit. Failure of this transformer will result in the loss of service to 709 customers for 10 hours.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$11,418

2015	2016	2017	2018	2019
\$158	\$273	\$570	\$1,261	\$2,155
2020	2021	2022	2023	2024
\$7,001	\$0	\$0	\$0	\$0





NYSEG

Hilldale - 115 kV Source, Transformer Bank Upgrade and Second 12 kV Distribution Circuit

Business Area: Electric

Responsible Group: Projects

Scope:

This project proposed to upgrade the Hilldale 34.5-12.5kV 10.5MVA (3-2.5/2.8/3.5MVA) substation transformers by adding two new 115-12.5kV 12/16/20 (22.4) MVA LTC transformers with provisions for four 12.47 kV distribution circuits. The transformers will be served from the 115kV rather than the 34.5kV transmission system.

Reasons and Benefits:

During the Summer of 2013, the Hilldale substation transformer was loaded up to 98% (10.3MVA) of nameplate rating. Plans have also been received for a new 100 home housing development. The substation has also experienced many outages on the 34.5kV sub-transmission. Charging the source from the 34.5kV to the 115kV transmission will improve the reliability and allow for future ties (without phasing issues) with the new future 115/12.5kV Old Fall substation. Moving the load from the 3.5kV to the 115kV transmission will also free capacity on the 34.5kV system.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$31,484

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$787	\$4,723	\$14,168	\$11,806	\$0





NYSEG

Lyon Mountain Replace Second 115/34.5kV Transformer

Category:	Capacity
Business Area:	Electric
Responsible Group:	Projects

Scope:

Replace the Lyon Mountain transformer/regulator combination with a new 115/34.5 kV, 12/16/20(22.4) MVA, LTC transformer.

Reasons and Benefits:

For overload of the Chateaugay 115/34.5 kV transformer or its 115kV connection, local sub marginal voltages appear. The exposure is 400 hrs/yr, affecting 5524 customers and 14.9 MW of load. Upgrading the Lyon Mountain transformer/regulator will allow load transfer to the Lyon Mountain substation.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$18,169

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$908	\$2,725	\$3,634	\$6,359	\$4,542





NYSEG

Morningside Heights - 2nd Transformer Bank, 3rd Circuit

Category:	Capacity	
Business Area:	Electric	

Responsible Group: Projects

Scope:

This project upgrades the existing 5 MVA 34.5-4.8 kV transformer with two new 12/16/20(22.4) MVA, 34.5-12.47 kV LTC transformer, with provisions for four 12.47 kV distribution circuit positions. Convert all existing circuits to 12.47 kV operation.

Reasons and Benefits:

In the summer of 2011, substation load reports indicate that the existing 5MVA transformer is loaded to 104% of its nameplate rating. Failure of this transformer will result in the loss of service to 1116 customers for 10 hours. In addition, Broome Community College has added 822KVA of new dormitories on the Morningside 674 on August 2014 with a second phase planned in the future. The new dormitories could put further stress on the transformer loading it up to 120%. In addition, a 2014 substation maintenance report has identified the Morningside transformer(s) as having a poor overall health index (50%) - marginal dissolved gas analysis (DGA); marginal Doble, high loading; very old transformers (60yrs); and de-graded insulation because of increasing gasses.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,506

2015	2016	2017	2018	2019
\$21	\$0	\$1	\$1	\$1
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$5,481





NYSEG

North Brewster Reinforcement

Category:	Capacity
Business Area:	Electric
Responsible Group:	Projects

Scope:

North Brewster Reinforcement project will strengthen the existing transmission system and increase the capacity of the Amenia substation in the Brewster Division, NY to meet the growing local demand. Three major customers are waiting for the completion of this project who will benefit from the upgrades. They are Silo Ridge, Cricket Valley and Olivet University. Silo Ride Field Club is a new residential and lodging facility in Amenia, NY; Cricket Valley Energy Center is a 1,100 megawatt (MW), natural gas-fired power plant in Dover, NY; Olivet University is a new institution in Dover, NY.

The project includes following system reinforcements and will be completed in two phases:

Phase I: Dover Plains substation expansion with a 46kV 5MVAR capacitor bank and accompanying equipment; Pawling substation expansion with two 115kV 44.1MVAR capacitor banks and accompanying equipment.

Phase II: Amenia substation rebuild with a 46/13.2kV, 20/26/33 (37.3) MVA transformer, low-side medium voltage GIS, low-side

capacitor bank and accompanying equipment, and conversion of 10 miles of 4.8kV circuits 153 and 154 to 13.2kV.

Reasons and Benefits:

Customer requested project to support new development.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$19,306

2015	2016	2017	2018	2019
\$0	\$44	\$2,505	\$8,267	\$1,816
2020	2021	2022	2023	2024
\$6,674	\$0	\$0	\$0	\$0





NYSEG North Broadway Add Second 115/34.5 kV Transformer

Category:	Capacity
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Business Area: Electric

Responsible Group: Projects

Scope:

The project will install a second 59/59/65 MVA LTC transformer in parallel with the existing transformers.

Reasons and Benefits:

Lancaster Division has low bus voltages along 34.5kV Line 525 under system normal. N-1 loss of existing 115/34.5kV transformer at the North Broadway Substation causes thermal overload at the Erie Street transformers and low voltage issues at the North Broadway Substation. The load threshold of this problem was 501MW in 2009, when the peak load was 506.5MW.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,116

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$674	\$2,023	\$2,698	\$4,721





NYSEG

Roll Road Add Second 115/34.5kV Transformer

Category:	Capacity
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Business Area: Electric

Responsible Group: Projects

Scope:

Install a new 34.5 kV, 5.4 MVAR switched capacitor bank at the Roll Road Substation.

Reasons and Benefits:

During the 2016 summer peak load period, an outage of the Roll Road 115/34.5 kV transformer would result in sub marginal voltages at the Roll Road Substation (89.0% of nominal 34.5 kV).

All amounts shown below in thousands for years 2015-2024

Total Project Cost:		\$18,995		
2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$950	\$2,849	\$3,799	\$6,648	\$4,749





NYSEG

Sloan - Add Second Transformer Bank and Fourth Circuit Position

Category:	Capacity
Category:	Capaci

Business Area: Electric

Responsible Group: Projects

Scope:

This project upgrades the existing 7.5 MVA 34.5-4.8 kV transformer to two 12/16/20(22.4) MVA, 34.5-12.47 kV LTC transformers, with provisions for four 12.47 kV distribution circuit positions. Convert all existing circuits to 12.47 kV operation.

Reasons and Benefits:

The loading on the existing 7.5 MVA transformer bank at the Sloan Substation has reached 102% of its PLBN rating during the summer peak of 2011. Loss of this transformer could affect 9 MW of load and 4,394 customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$27,403

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$685	\$4,111	\$12,332	\$10,276





NYSEG

Wood Street, Add Third 345/115 kV Transformer

Category:	Capacity
Business Area:	Electric
Responsible Group:	Projects

Scope:

Wood Street project will install a third 345/115 kV LTC transformer rated 150/200/250 MVA at Wood Street Substation and operate it in parallel with the two existing 345/115 kV LTC transformers.

Reasons and Benefits:

During the 2012 summer peak load period, when the Brewster Division load is greater than 153 MW, a forced outage of one of the existing 345/115 kV transformers at Wood Street Substation with the other 345/115 kV transformer already out of service long term, would cause widespread sub marginal voltages and thermal overloads throughout the Brewster Division. During summer peak load periods, there would be up to 200 MW of load and 35,000 customers at risk for potential load shed. Based on the current Brewster

Division summer peak load growth rate of 2.04% per year, it is expected that this area would be exposed to this potential problem for up to 5100 hours during the 2012 summer peak load period. The exposure is expected to increase by approximately 200 hours per year for each subsequent summer peak load period.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$22,821

2015	2016	2017	2018	2019
\$86	\$138	\$7	\$163	\$439
2020	2021	2022	2023	2024
\$1,250	\$12,255	\$8,481	\$0	\$0





NYSEG

BES Program - FERC Compliance

Category:	Compliance
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Business Area: Electric

Responsible Group: Projects

Scope:

As a result of the FERC Transmission Planning (TPL) Study, several capital projects have been identified that are mandatory to be complaint with NERC TPL Standards. These projects include transmission line and substation modifications and upgrades throughout the NYSEG service territory.

Reasons and Benefits:

The program is required for regulatory compliance.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$468,900

2015	2015	2016	2017	2018	2019
\$0	\$0	\$1,367	\$4,825	\$21,780	\$40,557
2020	2021	2022	2023	2024	
\$52,132	\$97,339	\$85,246	\$49,301	\$116,354	





NYSEG NERC Alert Priority III

Category:	Compliance
Business Area:	Electric
Responsible Group:	Projects

Scope:

The scope of this project is to replace 115kV existing wood structure with a new wood structure, insulators, and cross arms and braces. In addition, the scope involves re-tensioning of conductor to address the clearance violation. The NERC Priority III is not a rebuild project and no new conductor is being replaced.

Reasons and Benefits:

NYSEG must comply with the 2010 NERC Alert mandate to correct all conductors to ground clearances that do not meet NESC standards. Priority I and II line clearances were corrected by 2013. Priority III lines will be addressed in this phase of the project. The Priority III lines are all overhead 15kV transmission lines. There are 60 of these lines with 1,097 Point of Interests in NYSEG totaling 1,011 miles.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$64,309

2015	2016	2017	2018	2019
\$0	\$0	\$214	\$1,496	\$14,732
2020	2021	2022	2023	2024
\$9,108	\$9,108	\$9,108	\$9,108	\$11,436





NYSEG

Government Highway

Category:	Customer
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

This program relocates electric facilities that in conflict with highway and road projects being undertaken by municipalities and other government agencies.

Reasons and Benefits:

This work is required for the Company to remain in compliance with the terms and conditions to occupy public Rights of Way.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$32,161

2015	2016	2017	2018	2019
\$2,360	\$2,303	\$1,767	\$2,265	\$1,800
2020	2021	2022	2023	2024
\$4,081	\$4,203	\$4,329	\$4,459	\$4,593





NYSEG Industrial Commercial

Category:	Customer
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

This program provides service connections for industrial and commercial customer. The cost the service is comprised of tariff portions as well as customer payments for amounts above the tariff required provision.

Reasons and Benefits:

This program is required to provide service requested by industrial and commercial customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$50,453

2015	2016	2017	2018	2019
\$2,657	\$4,680	\$4,735	\$4,703	\$4,504
2020	2021	2022	2023	2024
\$5,495	\$5,660	\$5,830	\$6,005	\$6,185





NYSEG

Residential Line Extensions

Category:	Customer
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

This program provides distribution line extensions and necessary facilities to provide service to residential development projects. This program provides the necessary equipment (transformers, conductors, conduit, hand holds, man holes, etc.) to large scale residential projects. This program does not include the connection of individual residential units or meters.

Reasons and Benefits:

This program is necessary to meet our obligation to provide services to residential customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$83,944

2015	2016	2017	2018	2019
\$7,085	\$7,340	\$6,825	\$8,107	\$9,832
2020	2021	2022	2023	2024
\$8,430	\$8,683	\$8,943	\$9,212	\$9,488





NYSEG

Service Connections

Category:	Customer
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

Install new electric service to individual residential units where customers have requested service.

Reasons and Benefits:

Required to fulfill our obligation to serve non-industrial/non-commercial customers that request electric service.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$56,679

2015	2016	2017	2018	2019
\$4,261	\$4,883	\$6,264	\$6,096	\$6,732
2020	2021	2022	2023	2024
\$5,357	\$5,518	\$5,684	\$5,854	\$6,030





NYSEG

Street Lighting

Category:	Customer
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

This program provides new overhead street and area lighting and replaces damaged lighting facilities. This program also includes the conversion of existing lighting to LED lighting to those municipalities that request this change.

Reasons and Benefits:

This program creates safe and inviting areas throughout the communities we serve. The conversion to LED lighting will also increase energy efficiency.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$28,488

2015	2016	2017	2018	2019
\$945	\$1,402	\$1,276	\$947	\$6,096
2020	2021	2022	2023	2024
\$6,306	\$6,495	\$1,625	\$1,674	\$1,724





NYSEG

Substation Automation Program

Category:	Modernization	
Business Area:	Electric	
Responsible Group:	Electric Ops	
Coores		

Scope:

This program installs and upgrades SCADA controlled equipment at substations.

Reasons and Benefits:

This program installs and upgrades SCADA controlled equipment at substations that allows remote monitoring and control of substation equipment. This equipment increases efficiency by reducing the need to send personnel to substations to investigate issues and take measurements/readings.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$77,928

2015	2016	2017	2018	2019
\$0	\$2,929	\$4,935	\$5,360	\$7,791
2020	2021	2022	2023	2024
\$10,916	\$11,609	\$11,841	\$12,023	\$10,524





NYSEG

AMI

Category:	Modernization	
Business Area:	Electric	
Responsible Group:	OPTECH	

Scope:

NY AMI will install smart meters and associated equipment in NYSEG's territory.

Reasons and Benefits:

NY AMI will be an essential foundational system in realizing REV goals to empower customers through new tools and information to effectively manage and reduce usage, establish and animate new markets to promote the implementation of DER's, and minimize environmental impacts of power generation and energy consumption. NYSEG will gain early outage detection to assist with restoration efforts as well as streamline internal business processes.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$255,931

2015	2016	2017	2018	2019
\$0	\$0	\$1,082	\$457	\$451
2020	2021	2022	2023	2024
\$42.663	\$83.971	\$62.382	\$51.223	\$13.702





NYSEG

Electric Vehicle Infrastructure

Category:	Modernization
Business Area:	Electric
Responsible Group:	OPTECH

Scope:

NYSEG pays for and owns 100% of the interconnection cost and behind the meter electrical infrastructure for new electric vehicle chargers. Includes 1,600 L2 chargers, 85 L3 chargers, and 16 bus chargers. NYSEG owns 10 L3 chargers in underserved communities.

Reasons and Benefits:

This project supports the creation of an environment that facilitates and supports the adoption of electric transformation within our service territories. In order to encourage the growth of the EV Market, sufficient charging infrastructure is necessary.

Electrification of transportation is a key solution for de-carbonizing the economy and has the potential to place downward pressure on the electricity rates paid by all customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$21,566

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$4,717	\$5,617	\$5,617	\$0	\$5,617





NYSEG Non AMI DSIP ADMS

Category:	Modernization

Business Area: Electric

Responsible Group: OPTECH

Scope:

The ADMS (Advanced Distribution Management Systems) will provide the ability to test distribution power flow, volt-var optimization, demand response, FLISR (Fault Location, Isolation, and Service Restoration), and DERMS (Distributed Energy Resource Management System).

Reasons and Benefits:

This project will be a continuation of the ESC ADMS development project. Once the ESC ADMS Project is complete there will be a scalability plan that will address releasing certain components to other NY Regional Offices.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,208

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1,808	\$1,700	\$1,700	\$3,000	\$0





NYSEG Non-AMI DSIP Grid Automation

Category:	Modernization
Business Area:	Electric

Responsible Group: OPTECH

Scope:

Pursuant to the Commission's Order "Adopting Distributed System Implementation Guidance", NYSEG submitted their DSIP plan. DSIP is aimed at facilitating integration of clean energy resources and provide customers with the tools to be able to take greater control over their energy usage.

Reasons and Benefits:

DSIP Grid Automation will facilitate the automation penetration and will result in a more reliable network as well as a more efficient network to operate.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$232,186

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$26,602	\$28,238
2020	2021	2022	2023	2024
\$31,551	\$32,873	\$33,176	\$36,720	\$43,025





NYSEG Java NWA-Microgrid

Category:	Modernization
Business Area:	Electric

Responsible Group: NWA

Scope:

The Java NWA project was proposed to defer the planned traditional wires solution at the NYSEG Java substation for a period of seven years. The scope of the NYSEG Java NWA RFP was to solicit third party developers to propose NWA solutions that meet three needs:

 establish sufficient quantities of DER in the area served by Java substation to reduce the peak loading on the individual transformer bank to below its nameplate rating of 5 MVA,
establish sufficient quantities of DER to address reliability and power quality issues that exist on the Java 280 circuit and

3. establish sufficient quantities of DER to address the failure of the existing transformer.

During the initial RFP response review process, the decision was made to evaluate only proposals based on the first and third need while the second need would be addressed during the project implementation phase. The Java NWA RFP was structured such that third party developers could propose technologies that would be cost effective and technically feasible to meet the needs of the RFP.

NYSEG selected one NWA proposal to move forward with that addressed the first and third need listed above. While working with the developer to progress the NWA project, technical and operation uncertainties/complexities were identified with the micro-grid portion of the project, which addressed the third need above. After further discussion with the developer, a decision was made to split the project up into two separate projects. One project will be a peak shaving resource to address need number one above and one project will be a micro-grid that address need number three above.

Reasons and Benefits:

NYSEG is pursuing both Java NWA projects as cost effective alternatives to the planned traditional wires solution.

All amounts shown below in thousands for years 2015-2024





Total Project Cost: \$26,800

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1,000	\$15,800	\$10,000	\$0	\$0





NYSEG

General Equipment Operations T&D

Category:	System Operations
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Business Area: Electric

Responsible Group: Electric Ops

Scope:

This is a minor program to replace tools and equipment for Operations.

Reasons and Benefits:

This program allows the Companies to meet safety and OSHA requirements to replace tools and equipment at the end of their useful lives.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$11,585

2015	2016	2017	2018	2019
\$0	\$1,068	\$1,071	\$1,739	\$1,509
2020	2021	2022	2023	2024
\$1,167	\$1,202	\$1,238	\$1,276	\$1,314





NYSEG

Fossil Hydro Operations Minor Projects

Category:	Generation
Business Area:	Generation
Responsible Group:	Gen Del

Scope:

NYSEG Hydro Operations implements minor capital projects each year to address both planned and emergent projects that typically have a per project cost less than \$200,000. The minor capital project funds are allocated to specific minor projects as they emerge.

Reasons and Benefits:

Projects are implemented for a variety of electrical, mechanical, civil/structural and regulatory type projects at all generating facilities including powerhouses, dams, intake houses, substations and project lands to:

1) Install those necessary betterments to improve station reliability, unit efficiency, worker, public and project safety and site security 2) To achieve license/regulatory requirements 3) To replace end-of-life and obsolete equipment.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,194

2015	2016	2017	2018	2019
\$22	\$164	\$798	(\$143)	\$853
2020	2021	2022	2023	2024
\$1,500	\$1,500	\$1,500	\$1,500	\$1,500







NYSEG

Mechanicville Hydro Spillway Resurfacing

Category:	Generation
Business Area:	Generation
Responsible Group:	Gen Del

Scope:

In addition to resurfacing the dam spillway and installation of a new steel reinforced concrete dam toe, the overall project work scope will include new Obermeyer gate pneumatic air bags used in operation of each Bay, new inclinometers, mechanical gate holding / isolation devices (to create a safe isolated work area for personnel performing inspection and maintenance on the spillway), air header auto blowdown to eliminate moisture build-up in the pneumatic system, fall protection system, east and west pier resurfacing, and infill of the former hydraulic operating cylinder portals. The work will occur while the plant is online and the units (and alternate spillgates) will maintain a pond elevation below the top of gate to create a safe and dry work area. Engineering is planned for 2019, procurement of a general contractor in 2020, Bay C construction in 2021, Bay B in 2022, and Bay A in 2023.

Reasons and Benefits:

The spillway is approximately 700 feet long, and is comprised of three individually operating 220-ft crest gate systems in Bays A, B, and C. Due to its aging condition, NYSEG is planning to resurface the existing dam spillway surface from the downstream edge of the crest gates to the toe. The dam toe has experienced scour / erosions over decades of use that the Federal Energy Regulatory Commission (FERC) is aware through inspections that NYSEG has performed. NYSEG provided a plan and schedule to the FERC, upon request, on June 15, 2017 and has committed to address the dam toe scour on all three Bays by no later than the fourth quarter 2023.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,028

2015	2016	2017	2018	2019
\$0	\$0	\$1	\$4	\$173
2020	2021	2022	2023	2024
\$150	\$2,850	\$2,900	\$2,900	\$50



NYSEG

Kent Falls Upgrade

Category:	Generation
Business Area:	Generation
Responsible Group:	Gen Del

Scope:

This project consists of three parts:

1. Ring Girder Project - fabrication and installation of new penstock ring girders used to support the existing 11 foot diameter steel penstock. New Ring Girders to be installed over a distance of 1,000 feet.

2. Trifurcation and Penstock Project fabrication and installation of a new section of steel penstock that transitions from 11 foot diameter to three 6.5 foot diameter steel penstocks, along with three new 6.5 foot diameter steel penstocks to each turbine-generator

3. Tailrace Wall Project - design, removal and installation of new steel reinforced concrete wall in the tailrace of NYSEG Kent Falls Powerhouse that directs water discharged from the turbine-generators back to the river.

Reasons and Benefits:

1. Ring Girder Project - the existing steel penstock saddles are at end of life and the interface with the steel penstock is creating stress points, resulting in localized water leakage from penstock movement during station operation. The new penstock ring girder design will eliminate the pinch stress points and annual maintenance required to address the on-going penstock leaks.

2. Trifurcation and Penstock Project - the existing trifurcation and penstocks are original fabrication, circa 1928, and is at end of life. Installation of new trifurcation and penstock sections will eliminate the need for annual inspection and routine repairs, reduce personnel safety access issues and improve operational reliability.

3. Tailrace Wall Project - the existing wall, installed circa 1928, is at end of life and has failed. Reconstruction of the wall is required and is an obligation / commitment that NYSEG has with the FERC. In addition, fabrication and installation of new draft tube stop gates is planned for isolation of the river from the powerhouse. This will improve / create an isolated work area for personnel during turbine-generator maintenance.





All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,507

2015	2016	2017	2018	2019
\$0	\$32	\$493	\$1,061	\$3,735
2020	2021	2022	2023	2024
\$5,186	\$0	\$0	\$0	\$0





NYSEG

Albion - Eastern System Improvement and Reliability Project

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install a new gate station, district regulator station and 7.6 miles of 8" plastic 124 psi main.

Reasons and Benefits:

The 124 psi system has a greater than 50% drop at its endpoint Gaines Station and Albion has limited capacity. This project will improve the pressure on the 124 psi system north and west of Albion in the Towns of Medina and Oak Orchard and the medium pressure systems in Gaines, Murray, Holley and Albion.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$4,500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$500	\$2,000	\$2,000





NYSEG

Boswell Hill Bare Steel Main Replacement Project

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install new 10 inch wrapped steel gas main.

Reasons and Benefits:

Existing gas main is unprotected steel and undersized for system capacity. This project will replace sections over a three year period with the tie in and abandonment of the unprotected steel to take place in the third year.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,240

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$2,240





NYSEG

Canandaigua Feeder Main Reinforcement Project

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install approximately 8,700 linear feet of 8-inch HDPE gas main, from the intersection of Rte. 21 and Schutt Road to the existing pipeline crossing at North Road (approximately 1,200 linear feet southwest of Andrews Road).

Reasons and Benefits:

Existing system is below 70% of maximum allowable operating pressure (MAOP) at Design Day conditions. The system is experiencing growth and lacks capacity to support additional load. These improvements would reinforce the system and improve reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$100	\$900	\$0	\$0





NYSEG

Chambers Road Gas Main Replacements

Category:	Asset Condition	Reliability
Calegory.	Assel Condition,	Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace pipe impacted by leak of diesel from Columbia into NYSEG's distribution system. Extent of diesel migration is being determined. Estimate two miles per year of gas main replacement. A portion of the cost may be reimbursed by Columbia.

Reasons and Benefits:

Replace plastic pipe impacted by diesel infiltration from Columbia's system. Diesel fuel is not compatible with plastics, softening the plastic gas main compromising its integrity and safety. Adjacent steel gas mains may also be replaced.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$500	\$500	\$500	\$500	\$0




NYSEG

Fuller Hollow Rd 25 psig Loop

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install approximately 1 mile of 6" PE main from the existing 4"PE 25 psig main at house #100 Foster Rd east to Bunn Hill Rd. Continue east on Bunn Hill Rd (which turns into Fuller Hollow Rd) to tie in to 8" SWP 25 psig MAOP main at house #3900 Fuller Hollow Rd.

Reasons and Benefits:

The Vestal Center south terminal of the Vestal 25 psig MAOP system has an existing Design day pressure drop to 8 psig (32% of MAOP). Installation of the Fuller Hollow Rd loop would raise design day terminal pressure approximately 4 psig to 12 psig (48% of MAOP).

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,583

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024 \$1 583



NYSEG

Gas Distribution Mains - Replacements

Category:	Asset Condition, Reliability
Business Area:	Gas
Responsible Group:	Gas Ops
Scope:	

This is a minor program to replace gas mains as required due to asset condition, conflicts and other identified field conditions.

Reasons and Benefits:

This is a minor program to replace gas mains as required due to asset condition, conflicts and other identified field conditions.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$26,520

2015	2016	2017	2018	2019
\$2,144	\$2,190	\$2,438	\$2,329	\$3,416
2020	2021	2022	2023	2024
\$2,690	\$2,744	\$2,799	\$2,856	\$2,913





NYSEG

Gas Operations General Equipment

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This is a minor program to replace tools and equipment for Gas Operations.

Reasons and Benefits:

This program allows the Company to meet safety and OSHA requirements to replace tools and equipment at the end of their useful lives.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,238

2015	2016	2017	2018	2019
\$765	\$754	\$654	\$955	\$833
2020	2021	2022	2023	2024
\$820	\$838	\$855	\$873	\$891





NYSEG

Gas Regulator Modernization and Automation Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This program replaces equipment that is obsolete or in poor asset or operating condition. Replacements include: regulators, filters, heaters, odorizers, backup generators, chart recorders, valves, inlet and outlet piping, enclosures, associated fittings, and corrosion protection. The program also includes automation of equipment such as: RTUs, Telog endpoints, and automated regulator operation as appropriate.

Reasons and Benefits:

This modernization and automation program improves system reliability, reduces maintenance costs, reduces potential outages due equipment failures, and improves equipment standardization and safety. Decreasing the capital allocated to this program increases the risk and reliability of gas distribution due to obsolete equipment in poor condition and lack of replacement parts. This can result in safety issues that impair or prevent annual inspections required by 16NYSCRR Part 255.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$28,320

2015	2016	2017	2018	2019
\$562	\$1,304	\$2,382	\$6,073	\$2,878
2020	2021	2022	2023	2024
\$3,024	\$3,024	\$3,024	\$3,024	\$3,024





NYSEG

Hornby Station Rebuild

Category:	Asset Condition,	Reliability
	,	

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This gate station project will replace existing equipment that is in poor condition, replace buildings also in poor condition, demolish buildings and remove equipment no longer necessary as well as correct site conditions.

Reasons and Benefits:

The existing station is in poor condition, the buildings are deteriorated and numerous. The current design standards for a gate station include dual-run regulators for reliability of service. There may be hazardous materials found that will require removal and clean-up.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,457

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$312	\$145
2020	2021	2022	2023	2024
\$3,000	\$0	\$0	\$0	\$0





NYSEG

Interconnect Between Wallace and Dansville

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install 7.4 miles of 8" plastic 51psig main.

Reasons and Benefits:

Wayland is at the end of the Dansville 60psig system with endpoint pressures dropping to greater than 50% of MAOP on Design Day. The interconnect project creates a feed from the east increasing pressure and reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,400

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$400	\$1,000	\$1,000





NYSEG

Leak Prone Main Replacement Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This program replaces leak prone gas mains identified as leak prone and includes mains replaced due to condition (DIMP and leaks) and municipal projects.

Reasons and Benefits:

The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The gas main replacements result in a distribution system that is safer and more reliable.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$207,521

2015	2016	2017	2018	2019
\$16,094	\$16,848	\$22,636	\$18,441	\$20,127
2020	2021	2022	2023	2024
\$21,576	\$22,458	\$22,951	\$22,954	\$23,436





NYSEG Leak Prone Services Replacement Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace leak prone gas services are required to be replaced by various regulations. This work includes but is not limited to: replacing gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way; leak prone gas main replacements per rate cases; tariff or code requirements; and actively leaking services.

Reasons and Benefits:

Leak prone gas services are required to be replaced by various regulations to keep customers and their properties safe from potential gas leaks.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$56,433

2015	2016	2017	2018	2019
\$4,278	\$5,519	\$5,886	\$4,890	\$4,559
2020	2021	2022	2023	2024
\$6,014	\$6,134	\$6,258	\$6,384	\$6,512





NYSEG

Low Pressure Relief Valve Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Add relief valves at low pressure regulator stations that currently have working monitors for over pressure protection (approximately 30 stations). Scope of work varies based on station needs from addition of relief valve to full rebuild of station. These stations are located in the Elmira, Olean and Binghamton divisions on gas systems previously owned by Columbia Gas. This program is supplemental to the gate and regulator station modernization program.

Reasons and Benefits:

As a result of the incident in September 2018 on Columbia owned gas facilities in Massachusetts, utilization of working monitor regulators to provide over pressure protection on low (utilization) pressure systems has become an industry concern. All pressure systems have over pressure protection at gate and regulator stations. On gas systems that operate above low pressure, there is additional pressure regulation at the customers' services. Low pressure systems directly delivery low (utilization) pressure to customers without additional pressure regulation or over pressure protection. The addition of a full capacity relief valve downstream of the existing monitor regulators on low pressure systems provides a secondary overpressure protection device for these customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$500	\$500	\$500	\$500	\$500





NYSEG

Non-Leak Prone Services Replacement Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace or tie-over any service associated with a gas main replacement project that does not qualify as a leak prone service in accordance with DIMP.

Reasons and Benefits:

This work is required by various regulations. The work replaces gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rightsof-way, leak prone gas main replacements per rate cases, tariff or code requirements, actively leaking services etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$45,477

2015	2016	2017	2018	2019
\$130	\$3,411	\$4,845	\$3,605	\$2,878
2020	2021	2022	2023	2024
\$5,881	\$5,999	\$6,119	\$6,242	\$6,367





NYSEG

Pendleton - South West System including the Town of Pendleton improvement project

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install a new District Regulator Station and 13,000 ft of 8" plastic 51psig main.

Reasons and Benefits:

The 51psig system has a greater than 50% drop at its endpoints. This project will improve pressure at the endpoints of system.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,041

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$41
2020	2021	2022	2023	2024
\$0	\$2,000	\$0	\$0	\$0





NYSEG	
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Slaterville Rd

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas OPs

Scope:

Replacement of approximately 14,000' of 10" leak prone steel pipe with 12" SWP 124Psig pipe utilizing the existing right of way (ROW) from the East Ithaca POD northwest along Slaterville Rd to Pine Tree Rd, north along Pine Tree Rd to the Ellis

Hollow regulator station. Retirement of existing field regulators. Retirement and replacement of long-side services with individual dedicated services. Installation of approximately 11'000 of 8" HDPE 33 psig pipe along Slaterville Rd from the existing 33 psig main at Pine Tree Rd, southeast to the existing 33 psig main near German Cross Rd, with a lateral tie to the existing 33 psig Besemer regulator station at the East Ithaca POD.

Reasons and Benefits:

Design Day for the Ithaca division is 75 heating degree days (HDD). At Design Day load conditions the Slaterville Rd 124 psig feeder main carries about 720 mcfh. The existing 10"SWP has a drop to 83% MAOP. The 12" SWP replacement main will improve operating pressures to 90% MAOP, increasing capacity and operational safety. The existing 124 psig main is tapped for Field Regulators at numerous points. These feed an atypical network of shared services which has grown organically over the years. The services cross multiple property lines, and under Slaterville Rd (NYS Rt 79) to serve houses on the south side of the highway. The installation of new 33 psig MAOP 8"PE main and standardized 2"PE lateral mains along Slaterville Rd will allow the local residences to be served at medium pressure with individual dedicated services and the retirement of the farm taps. Existing lateral mains fed by small district regulator stations (DRS) will be fed by the new 33 psig MAOP mains, and upgraded or replaced as necessary.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$16,045





2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$45
2020	2021	2022	2023	2024
\$0	\$1,000	\$15,000	\$0	\$0





NYSEG

Vienna Rd-Macedon Feeder Main Replacement

Category:	Asset Condition, Reliability
Business Area:	Gas
Responsible Group:	Gas Ops

Scope:

The project plans to install approximately 39,500 feet of 10-inch, 124 psig steel gas main, from the Vienna Road Regulator Station to the Palmyra City Gate Regulator Station.

Reasons and Benefits:

The purpose of this project is to increase pressure along the Vienna Road-to-Macedon 124 psig feeder main to serve new load and while maintaining 70% of system MAOP (87 psig out of 124 psig) on Design Day in accordance with IUSA's Gas System Planning Manual planning and design criteria. The existing system is below 50% of maximum operating pressure on Design Day at the Quaker Road Regulator Station (Macedon). The system is experiencing growth and lacks capacity to support additional load. The downstream system, the Macedon 45 psig MAOP system, has been supplemented by an emergency interconnect with RG&E since 2008 to maintain system pressures during peak usage periods. This system capacity improvement project will increase reliability to the following NYSEG municipalities: Newark, Manchester, Palmyra, Macedon.

The project will accommodate existing customer load demand, allowing NYSEG to maintain adequate system pressure and meet NYSEG's obligation to serve new customers in existing franchise area. Approximately 4,000 existing customers will benefit from this increase in reliability.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$23,699

2015	2016	2017	2018	2019
\$0	\$0	\$462	\$2,959	\$278
2020	2021	2022	2023	2024
\$19,000	\$1,000	\$0	\$0	\$0





NYSEG

West Genesee Street Leak Prone Main Replacement

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install 40,127 feet of 8" 124 psig MAOP, HDPE main to replace approximately 67,500 feet of 10" steel leak prone 124 psig gas main over 4 years. This project is being individually listed outside the Leak Prone Mains Program due to the project cost.

Reasons and Benefits:

The project replaces leak prone main (LPM), contributing to the LPM program.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$4,900

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1,400	\$1,000	\$1,000	\$1,500	\$0





NYSEG

Gas Meters

Category:	Customer
Business Area:	Gas
Responsible Group:	Customer Service
Scope:	

This program is for the purchase and installation of gas meters to replace existing, aged meters as they are removed from service as well as for new installations.

Reasons and Benefits:

Gas meters are exchanged for annual PSC required programs including Statistical Sampling and Remediation programs and for other various reasons including relocation, load increases, meter damaged, special testing, replace non-tc meters. The programs ensure accurate recording of customers usage and result in accurate customer billing.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$27,106

2015	2016	2017	2018	2019
\$608	\$1,851	\$3,830	\$3,452	\$3,665
2020	2021	2022	2023	2024
\$2,500	\$2,000	\$2,400	\$2,800	\$4,000





NYSEG

Gas Regulators

Category:	Customer
Business Area:	Gas
Responsible Group:	Customer Service

Scope:

This program is for the purchase and installation of gas regulators for new installations, and some replacements.

Reasons and Benefits:

Gas regulators are used to maintain the pressure for the system and for the customer's services so their appliances operate correctly and safely.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,296

2015	2016	2017	2018	2019
\$2,098	\$2,018	\$4,025	\$155	\$293
2020	2021	2022	2023	2024
\$317	\$323	\$330	\$337	\$400





NYSEG

Gas Distribution Mains - New Installations

Category:	Customer
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Business Area: Gas

Responsible Group: Gas Ops

Scope:

This is a minor program to install new gas mains to customers requesting gas service.

Reasons and Benefits:

This is a minor program necessary to remain in compliance with tariffs.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$29,158

2015	2016	2017	2018	2019
\$1,654	\$3,091	\$3,526	\$1,416	\$1,882
2020	2021	2022	2023	2024
\$3.380	\$3.447	\$3.517	\$3.587	\$3.659





NYSEG

Install New Gas Services

Category: Cus

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install new gas services to new customers and replace gas services in conflict with street reconstruction projects.

Reasons and Benefits:

This program is necessary to connect businesses and residence that request gas service in accordance with tariffs.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$41,073

2015	2016	2017	2018	2019
\$5,807	\$5,351	\$3,422	\$3,241	\$3,593
2020	2021	2022	2023	2024
\$3,777	\$3,853	\$3,930	\$4,009	\$4,090





NYSEG

Large Government Jobs

Category:	Customer
Business Area:	Gas

Responsible Group: Gas Ops

Scope:

This program replaces gas mains in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way.

Reasons and Benefits:

This is a program for work mandated by government entities and is necessary to comply with the terms and conditions to occupy public Right of Way.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,290

2015	2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024	
\$0	\$2,493	\$2,545	\$2,599	\$2,654	





NYSEG

Minor Government Jobs

Category:	Custome	
Business Area:	Gas	

Responsible Group: Gas Ops

Scope:

This is a minor program to replace gas mains that may be in conflict with municipal street and highway projects.

Reasons and Benefits:

This is a program for work mandated by government entities and is necessary to comply with the terms and conditions to occupy public Right of Way.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,893

2015	2016	2017	2018	2019
\$976	\$751	\$1,019	\$1,263	\$749
2020	2021	2022	2023	2024
\$1,563	\$1,594	\$1,626	\$1,659	\$1,692





NYSEG

Town of Maine Franchise Expansion

Category:CustomerBusiness Area:GasResponsible Group:Gas OpsScope:Extend mains 14,500 feet and services.

Reasons and Benefits:

Meet customer demand for gas service as authorized by NYPSC.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,450

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1,450	\$0	\$0	\$0	\$0





NYSEG Gas RTU/Telemetry Upgrades

Category:	Modernization
Business Area:	Gas
Responsible Group:	Gas Ops

Scope:

This project replaces the remaining Fisher ROC 300s (approximately 130-140 units) not replaced with the Zeck 9000 odorizers (combined replacement program). Currently, NYSEG utilizes the Fisher ROC 300 series Remote Terminal Unit (RTU) at all remote operated regulator stations and terminal pressure monitoring locations. The Fisher ROC allows Gas Control to remotely operate and monitor regulator stations and terminal endpoint pressures throughout the NYSEG franchise.

Reasons and Benefits:

The Fisher ROC 300 series is obsolete. This project proposes to replace this equipment with the current Fisher FloBoss FB107 technology. Currently NYSGE utilizes the ROC link for communications with the Fisher ROC 300 series and is compatible with the new FloBoss FB107 technology which will minimize impact to field operations. Installation of the FloBoss FB107 comes with a backplane that allows it to fit exactly where the existing Fisher ROC 300 series is mounted which will minimize installation costs. This program covers the 130-140 units not included in the combined RTU and Zeck 9000 odorizer replacement project.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$8,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$2,000	\$2,000	\$2,000	\$2,000	\$0





NYSEG

Gas RTU/Telemetry Upgrade and Zeck 9000 Odorizer Upgrades

Category: Modernization

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Currently, NYSEG utilizes the Fisher ROC 300 series Remote Terminal Unit (RTU) at all remote operated regulator stations and terminal pressure monitoring locations. The Fisher ROC allows Gas Control to remotely operate and monitor 256 regulator stations and terminal endpoint pressures throughout the NYSEG franchise

Reasons and Benefits:

The Fisher ROC 300 series is obsolete. This project proposes to replace this equipment with the current Fisher FloBoss FB107 technology. Currently NYSGE utilizes the ROC link for communications with the Fisher ROC 300 series and is compatible with the new FloBoss FB107 technology which will minimize impact to field operations. Installation of the FloBoss FB107 comes with a backplane that allows it to fit exactly where the existing Fisher ROC 300 series is mounted which will minimize installation costs.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$11,371

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$404	\$3,343
2020	2021	2022	2023	2024
\$3,800	\$3,325	\$500	\$0	\$0





NYSEG

AMI

Category:	Modernization	
Business Area:	Gas	
Responsible Group:	OPTECH	

Scope:

NY AMI will install smart meters and associated equipment in NYSEG's territory.

Reasons and Benefits:

NY AMI is an essential foundational system in realizing REV goals to empower customers through new tools and information to effectively manage and reduce usage, establish and animate new markets to promote the implementation of DER's, and minimize environmental impacts of power generation and energy consumption. NYSEG will gain early outage detection to assist with restoration efforts as well as streamline internal business processes.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$65,315

2015	2016	2017	2018	2019
\$0	\$0	\$50	\$114	\$113
2020	2021	2022	2023	2024
\$10,534	\$21,668	\$16,409	\$12,925	\$3,502





NYSEG

Brewster Service Center - Space Efficiency Renovation

Category:	Common - Facilities

Business Area: Common

Responsible Group: General Services

Scope:

Updating renovated office areas with new carpet, ceiling grid, lighting, and furniture.

Reasons and Benefits:

Reduced heating and cooling needs in mothballed areas, reduction of janitorial services.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$550

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$50	\$500





NYSEG

Building Projects and Space Management Projects

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services
Scope:	

Provide new layouts, building systems and equipment in our facilities.

Reasons and Benefits:

To assure building reliability in support of all departments, improved safety, increased energy efficiency and the management of the office space.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,653

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$153
2020	2021	2022	2023	2024
\$500	\$500	\$500	\$500	\$500





NYSEG

Deposit Upgrades

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

Building improvement project to the Deposit facility

Reasons and Benefits:

The Deposit roof has reached its end of life and needs to be replaced to maintain proper protection from the outdoor elements for normal and emergency business. Other improvements are being planned to upgrade windows, doors, façade, etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$500	\$0	\$0



NYSEG

Elmira Service Center - Space Efficiency Renovation

Category:	Common - Facilities
Business Area:	Common

Responsible Group: General Services

Scope:

Provide new layouts, building systems and equipment in our facilities.

Reasons and Benefits:

To assure building reliability in support of all departments, improved safety, increased efficiency and the management of the office space.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$770

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$70	\$700	\$0	\$0





NYSEG Facilities Projects

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services
Scope:	
Minor capital projects (\$1	k to \$99k) improvements throughout the year.

Reasons and Benefits:

Improvements and upgrades to systems due to end of life or failures associated with mechanical, electrical, building structures, control systems etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$15,343

2015	2016	2017	2018	2019
\$1,394	\$1,468	\$2,777	\$296	\$738
2020	2021	2022	2023	2024
\$1,415	\$1,415	\$1,415	\$1,415	\$3,010





NYSEG

Generator Upgrades

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

Building improvement projects (capital projects) through the year.

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with backup generators, ATS, electric distribution system, etc.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$1,300

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$100	\$0	\$250	\$350	\$600





NYSEG Long Lake Upgrades

Category:	Common - Facilities
Business Area:	Common

Responsible Group: General Services

Scope:

Building improvement project to the Long Lakes facility

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with mechanical, electrical, building structures, control systems etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$750

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$750	\$0	\$0



NYSEG

Misc General Construction

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

This is a holding amount that supports company occupied facilities throughout the NYSEG Service Area. The projects that would eventually listed individually vary from year to year, some being reactive projects to replace items that have failed suddenly others being small proactive projects to replace systems that have reached the end of their life. Samples of these types of projects include small roof replacements, small area upgrades, and limited (i.e. not entire facility) window replacements.

Reasons and Benefits:

The planned projects increase energy efficiency and reduce potential damage to facilities due to failed roofs, plumbing, etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$550

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$550





NYSEG

Oneonta Chiller Replacement

Category:		Common - Facilities
	-	•

Business Area: Common

Responsible Group: General Services

Scope:

System improvement project to replace the Oneonta Chiller

Reasons and Benefits:

Oneonta main chiller is near the end of life and needs to be replaced in order to maintain climate control within the Oneonta facility. A new chiller will also improve energy efficiency.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$500	\$0	\$0





NYSEG Roof Upgrades

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services
Scope:	
Building improvement pro	jects (capital projects) through the year.

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with roof membranes, decking, fascia, soffits, flashing, curbing, etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$750

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$750	\$0





NYSEG

Site Upgrades

Category:	Common - Facilities
Business Area:	Common

Responsible Group: General Services

Scope:

Project improvements to upgrade parking lot to eliminate trip/fall hazards, lawn and other site work.

Reasons and Benefits:

This project will increase facility safety.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,450

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$1,450




NYSEG

Telematics Replacement Project

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

To replace and install telematics devices in all AVANGRID owned vehicles.

Reasons and Benefits:

To retrofit telematics units to increase safety and security due to the ability to monitor driving behavior, reduce vehicle idling lowering fuel consumption and increase business efficiencies through vehicle tracking sites.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,223

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$2,223





NYSEG

Video Conferencing Equipment

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

This project will install additional and upgrade existing video conferencing equipment as needed.

Reasons and Benefits:

This program allows the Companies to meet needs related to video conferencing.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$750

2015	2016	2017	2018	2019
\$0	\$90	\$143	\$4	\$7
2020	2021	2022	2023	2024
\$89	\$89	\$89	\$89	\$150





NYSEG

Human Resource Training Projects

Category:	Common - Facilities

Common

Business Area:

Responsible Group: Other

Scope:

This is a project to replace equipment for the training department. Equipment replacements include, but are not limited to, McElroy Taps, PowerComm PLC application simulator for substation and meter training, Mueller tapping equipment, Adapter test sets, Zeck odorizers, Megger PQ analyzer kits, 3 Phase Recloser for training, Doble Sets and Rangefinder for electric field planning training.

Reasons and Benefits:

The program replaces equipment for training to maintain standards and facilitate training activities.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,222

2015	2016	2017	2018	2019
\$0	\$28	\$460	\$327	\$267
2020	2021	2022	2023	2024
\$40	\$800	\$4,500	\$0	\$800





NYSEG

Fleet Light Duty Vehicle Leases

Category: Common - Fleet

Business Area: Common

Responsible Group: Fleet

Scope:

This is a minor program to replace light duty fleet vehicles. Light duty vehicles include vehicles such as compact SUV, full-size pick-ups, half-ton vans and other vehicles with gross vehicle mass rating (GVMR) of under 10,000 pounds.

Reasons and Benefits:

The program replaces light duty vehicles to maintain a reliable and safe fleet.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$26,695

2015	2016	2017	2018	2019
\$0	\$3,102	\$0	\$5,081	\$1,454
2020	2021	2022	2023	2024
\$1,371	\$3,012	\$3,393	\$3,400	\$5,882





NYSEG

Fleet Purchase

Category:	Common - Fleet
Business Area:	Common
Responsible Group:	Fleet

Scope:

This is a minor program to replace medium and heavy duty fleet vehicles and vehicular construction equipment. Medium duty equipment includes vehicles such as dump trucks, stake trucks, step vans and other vehicles with a gross vehicular mass rating between 10,000 and 26,000 pounds. Heavy duty equipment includes vehicles such as bucket trucks, digger derricks, semi-tractor, large dump trucks and other vehicles with a gross vehicular mass rating greater than 26,000 pounds. Vehicular construction equipment includes equipment such as back hoes, excavators, all-terrain vehicles, forklifts, tracked digger, cargo trailers, flatbed trailer and pole dollies.

Reasons and Benefits:

The program replaces vehicles to maintain a reliable and safe fleet.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$101,960

2015	2016	2017	2018	2019
\$0	\$6,644	\$10,772	\$12,173	\$11,680
2020	2021	2022	2023	2024
\$14,057	\$20,538	\$10,174	\$3,623	\$12,299





NYSEG

Building Management System

Category:	Common – IT
Business Area:	Common
Responsible Group:	General Services

Scope:

Developing a new Building Management System that would be used at all AVANGRID Facilities with an open protocol system (non- proprietary).

Reasons and Benefits:

Currently, our BMS is different at each OPCO and is proprietary, meaning that we have to sole source the monitoring and service contract each year without the ability to competitively bid the support. Having a new system with remote capabilities tied to our laptops or tablets will allow Facilities personnel to monitor and control all systems.

All amounts shown below in thousands for years 2015-2024 *Total Project Cost:* \$2,100

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$600	\$1,500	\$0	\$0	\$0



NYSEG

Client Project Requests and Integration Projects

Category:	Common - IT
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Business Area: Common

Responsible Group: IT

Scope:

The program is a placeholder for business initiatives identified by the Networks business areas for future efficiency projects. During annual demand planning, new projects are identified by business stakeholders to implement automation and efficiency initiatives.

Reasons and Benefits:

This program allows for process improvements within the Companies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$41,033

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$6.796	\$7.995	\$8,156	\$8.320	\$9.767





NYSEG

Database Lifecycle

n - IT
)

Business Area: Common

Responsible Group:

Scope:

The scope of this project includes the following:

IT

-Replacement of Physical Servers

-Wintel Hardware in alignment with the Wintel framework agreement

- -Lifecycle Services
- -Capitalization of existing out task services that will support the project.

-Reduces OPEX charges for Infrastructure Out-task Agreement.

-Software Licensing Database Software (Oracle, SQL etc.)

Reasons and Benefits:

The objective of this lifecycle project is to provide the business with current versions of Oracle and SQL Server instances in both the Rochester and Augusta locations. Deployments for both Oracle and SQL Servers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,668

2015	2016	2017	2018	2019
\$0	\$0	\$194	\$206	\$423
2020	2021	2022	2023	2024
\$367	\$375	\$367	\$367	\$367





NYSEG

Desktop Lifecycle

Category:	Common -	IT

Business Area: Common

Responsible Group:

Scope:

The project includes project management to include deployment strategy, client communication, and procurement of PCs in a timely manner.

Reasons and Benefits:

The primary purpose of the PC Lifecycle Replacement program is to standardize the desktops. New PCs are more reliable, have more memory, and faster processing speeds, resulting in quicker response when utilizing multiple applications.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,258

IT

2015	2016	2017	2018	2019
\$0	\$0	\$243	\$161	\$74
2020	2021	2022	2023	2024
\$342	\$349	\$356	\$364	\$371





NYSEG

Disaster Recovery Lifecycle

· IT

Business Area: Common

Responsible Group: IT

Scope:

Disaster Recovery LC involves refresh of DR infrastructure (servers, storage, databases, networking, etc.) to enable the recovery or continuation for IT systems supporting critical business functions in the case of an event causes primary system to be unavailable.

Reasons and Benefits:

This program allows for adequate backup for Company processes.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,981

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$994	\$994	\$994	\$0	\$0





NYSEG

Document Management System

Category:	Common - IT
Business Area:	Common

Responsible Group:

Scope:

The objective of this project is to implement a centralized system to store records and information that has value to the organization. AVANGRID's intent is to select an ECM solution with the initial implementation in the two business areas "HR" and "Compliance" as part of digital strategy for managing and organizing its electronic and physical information. There is potential opportunity to expand this solution to other business areas as needed across the organization level.

Reasons and Benefits:

This system will be used for the systematic collection, organization and management of information that can be accessed by a designated audience (e.g. executives, specific business areas, employees, etc.). The system will incorporate records retention requirements, document capture, workflow functionality and be supported by a centralized service.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$591

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$171	\$137	\$140	\$143	\$0







Category:	Common - IT
Business Area:	Common
Responsible Group:	IT

Scope:

Devices at Networks are over 4 years old and outside the warranty period. Overall goal will be to achieve 4-year lifecycle refresh across all of AVANGRID, however due to the large number of devices the scope of 2020 will be to refresh all devices over 4.5 years old and continue to reduce the aging devices in 2021. The goal of this project is to replace aged equipment at all AVANGRID Networks Companies.

The project will start in Q1-2020 and end in Q4 of 2020.

Reasons and Benefits:

The primary purpose of the Laptop Lifecycle Replacement program is to standardize the desktops while executing the IT strategy. New laptops are more reliable, have more memory, and faster processing speeds, resulting in quicker response when utilizing multiple applications.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,662

2015	2016	2017	2018	2019
\$0	\$0	\$283	\$45	\$501
2020	2021	2022	2023	2024
\$367	\$367	\$367	\$367	\$367



NYSEG

NetEng LC-Asset Replacement

Category:	Common - IT

Business Area: Common

Responsible Group: IT

Scope:

Purchase of replacement network devices in support of the Corporate network, including cisco routers, switches and wireless access points for deployment throughout the Company.

Reasons and Benefits:

The goal of this initiative is to replace obsolete and end of life telecommunications network devices on a recurring 7 year cycle, as required to:

- Address problematic devices
- Address end of life/end of service devices
- Ensure global alignment
- Update hardware to meet global security requirements as assigned
- Prepare for emerging technologies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,967

2015	2016	2017	2018	2019
\$0	\$0	\$175	\$241	\$355
2020	2021	2022	2023	2024
\$532	\$543	\$554	\$565	\$0





NYSEG NetSec Lifecycle

Category: Common - IT

IT

Business Area: Common

Responsible Group:

Scope:

Purchase of network security devices, as defined by Global Security blueprint: SSL Decryption, Sanboxing, NBA FW evolution continuation of Global QSR initiatives to further enhance the Company's network perimeter security to reduce risk of malicious activities.

Reasons and Benefits:

Enhance and/or refresh Corporate perimeter security, on a 5 - 7 year refresh cycle or as required to achieve global alignment, reduce risk associated with technical obsolescence (end of life/support as declared by the device manufacturer) and aged infrastructure and meet current required defense in depth standards.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,479

2015	2016	2017	2018	2019
\$0	\$0	\$141	\$112	\$492
2020	2021	2022	2023	2024
\$222	\$227	\$231	\$236	\$817





NYSEG

SAP Enhancements

Category: Common - IT

Business Area: Common

Responsible Group: IT

Scope:

This project will deliver a suite of changes following SAP ECC technical upgrade and introduction of CRM 7.0 into NYSEG to support AMI metering.

Reasons and Benefits:

This project will support the NY AMI project and changes following implementation.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,254

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$599	\$1,656	\$0





NYSEG

Storage Lifecycle

Category:	Common - IT	
Business Area:	Common	

Responsible Group: IT

Scope:

The scope of this project includes the following:

- Replacement of Storage Array devices,
- Organic Growth Storage additions
- DS8886 array
- NetApp file capacity
- SVC capacity licenses
- Out of warranty support
- Avoids large OPEX expense
- Infrastructure Services Migration services for efficiency.

Reasons and Benefits:

The goal of this project is to provide organic growth to existing storage arrays, replacement of aging, out of warranty, storage devices, as well as the migration of all impacted systems to the new devices. Additionally, the project will be engaged with infrastructure preparations for Data Center Consolidation along with leveraging the use of SVC in storage management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,264

2015	2016	2017	2018	2019
\$0	\$0	\$309	\$475	\$1,077
2020	2021	2022	2023	2024
\$653	\$666	\$680	\$695	\$709





NYSEG SMARTERWORKPLACE

ategory:	Common -	IT
ategory:	Common	-

Business Area: Common

Responsible Group:

Scope:

This project involves a global software license and software assurance enterprise agreement for desktop, application, and system installations.

Reasons and Benefits:

The Company receives costs based on the price level established by the number of device installations throughout the global enterprise.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,691

2015	2016	2017	2018	2019
\$0	\$50	(\$29)	\$2,516	(\$81)
2020	2021	2022	2023	2024
\$0	\$2.590	\$0	\$0	\$2.645





NYSEG

Toughbook Lifecycle

Category:	Common - IT
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Business Area: Common

Responsible Group: IT

Scope:

The project includes project management to include deployment strategy, client communication, and procurement of Toughbook in a timely manner.

Reasons and Benefits:

The primary purpose of the Toughbook Lifecycle Replacement program is to standardize the desktops while executing the ITstrategy. New Toughbooks are more reliable, have more memory, and faster processing speeds, resulting in quicker response when utilizing multiple applications.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$1,976

2015	2016	2017	2018	2019
\$0	\$0	\$172	\$10	\$127
2020	2021	2022	2023	2024
\$320	\$326	\$333	\$340	\$347





NYSEG

Unix Lifecycle

Category:	Common - IT	
Business Area:	Common	

Business Area:

Responsible Group:

Scope:

The scope of this project includes the following:

- Server Capacity and Replacement
 - Replacement of aging hardware
- Operating System Lifecycle

Upgrade of additional LPARs to AIX 7.1/7.2 as legacy applications are remediated.

Patch existing AIX 7.1/7.2 LPARs to the latest technology

- Firmware upgrades
- Infrastructure Services

 Out-task services
 Configuration / migration of new servers
 Project Management
 AIX Admins

Reasons and Benefits:

Provide organic growth to existing servers, replacement of aging, out of warranty servers, Firmware and OS patching. Additionally, this project will be engaged with infrastructure preparations for Data Center consolidation.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$6,785

2015	2016	2017	2018	2019
\$0	\$0	\$820	\$702	\$492
2020	2021	2022	2023	2024
\$915	\$934	\$954	\$974	\$994





NYSEG

Wintel Lifecycle

Category: Common - IT

Business Area: Common

Responsible Group:

Scope:

The scope of this project includes the following:

IT

• Replacement of Physical Servers: Wintel Hardware Servers (Type 1, 2 and 3) in alignment with the Wintel framework agreement

• Lifecycle Services: Capitalization of existing out task services that will support the project. Reduces OPEX charges for Infrastructure Out-task Agreement.

• Software Licensing: Wintel Software (Anti-Virus, Hardening, etc.)

Reasons and Benefits:

The objective of this lifecycle project is to replace the Company Windows infrastructure that is aging on a recurring 7 year cycle.

Data Center consolidations - infrastructure preparations and address Microsoft Enterprise Agreement (EA).

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$4,718

2015	2016	2017	2018	2019
\$0	\$0	\$337	\$385	\$1,543
2020	2021	2022	2023	2024
\$470	\$480	\$490	\$501	\$511





NYSEG

Workload Management and Optimization

IT

Category: Common - IT

Business Area: Common

Responsible Group:

Scope:

Robotics Process Automation (RPA) refers to a type of automation (called a robot or bot) which interacts with computed coded software that enables the automation of repetitive, rulebased processes, mimics interactions of users and works across functions and applications. The RPA bot user (virtual employee) executes the job just as an AVANGRID employees would.

The goal of the project is to define an RPA Strategic Program for Customer Service and to implement Bots to complete high value business processes.

Reasons and Benefits:

The project is introducing Robotics Process Automation for consistency, improved productivity, and to free up manual resources for more value-added tasks focused on improving customer service.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,082

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$917
2020	2021	2022	2023	2024
\$930	\$235	\$0	\$0	\$0





NYSEG

Lifecycle Replacement - ECC/XECS systems

Category:	Common - IT

Business Area:

Common

Responsible Group: OPTECH

Scope:

This is a program to replace ECC/XECS systems.

Reasons and Benefits:

This program allows the Companies to achieve critical systems uptime and cyber compliance targets.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,854

2015	2016	2017	2018	2019
\$0	\$0	\$1,279	\$5,558	\$823
2020	2021	2022	2023	2024
\$665	\$699	\$733	\$956	\$2,141





NYSEG OMS Enhancements

Category:	Common - IT	
Business Area:	Common	

Responsible Group: OPTECH

Scope:

This project will continue the build out of the NY Siemens Spectrum system and the OMS systems. The NY Spectrum system enhancements consist of SCADA, TNA and Software upgrade work.

Reasons and Benefits:

The continued buildout of these systems is critical to realize the full benefits and efficiencies these systems provide.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,322

2015	2015	2016	2017	2018	2019
\$0	\$0	\$0	\$1,845	\$2,182	\$1,420
2020	2021	2022	2023	2024	
\$375	\$375	\$375	\$375	\$375	





NYSEG

Siemens Spectrum Upgrade to V7

Category:	Common - IT	
Business Area:	Common	

Responsible Group: OPTECH

Scope:

This project is the NYSEG portion of the upgrade of Siemens Spectrum System to version 7. The Siemens Spectrum System provides EMS/SCADA/ADMS/OMS functionalities to operate the electric transmission and distribution systems in New York State.

Reasons and Benefits:

Spectrum 7 is the latest software version. Moving to the latest version will guarantee that we get the latest operating system, database and applications security patch. In addition, Spectrum 7 works on Linux which will allow the Company to span the hardware options.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,150

2015	2015 2016	2017	2018	2019
\$0	\$0 \$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$150	\$6.000	\$3.000





NYSEG

Telecomm NY WAN Expansion

Category:	Common - IT
Business Area:	Common
Responsible Group:	OPTECH

Scope:

NY WAN (Wide Area Network) Expansion involves WiMAX (Worldwide Interoperability of Microwave Access) Deployments to support automation activities at NYSEG.

Reasons and Benefits:

The NY WAN Expansion project is a WiMAX area network conceptualized to support smart grid communication equipment deployments as an end-to-end solution to meet requirements for communication paths and provide flexible solution for the company.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$36,222

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$2,511	\$10,212
2020	2021	2022	2023	2024
\$8,436	\$8,299	\$5,846	\$459	\$459





NYSEG

Energy Control Systems Infrastructure

Category:	Common – Operational	Technology
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Business Area: Common

Responsible Group: OPTECH

Scope:

NY Energy Control Systems Infrastructure encompasses incremental hardware refresh activities and technology upgrades as well as improvements to Electric, Gas and Business Area systems.

Reasons and Benefits:

These improvements are necessary to keep support, security and reliability at appropriate levels required by the demands of high availability of SCADA environments.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,860

2015 \$0	2016 \$0	2017 \$0	2018 \$0	2019 \$1,015
2020	2021	2022	2023	2024
\$315	\$315	\$315	\$1.500	\$400





NYSEG

Historian and Analytic Upgrades Program

Category: Common – Operational Technology

Business Area: Common

Responsible Group: OPTECH

Scope:

Integrate the Energy Management System data into the PI Historian system.

Reasons and Benefits:

The project will improve user access to data in a secure and reliable manner. There will also be increased efficiencies for all users that require access to critical information and allow for cross operating company visibility to key information to make decisions.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$6,979

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$3.379	\$0	\$3.600	\$0





NYSEG

Telecomm Fiber

Category:	Common – Operational Technology
Business Area:	Common
Responsible Group:	OPTECH

Scope:

The purpose of purchasing fiber optic cable is to enhance our connectivity and create high bandwidth communications and backhaul points.

Reasons and Benefits:

This project will minimize the number of microwave hops and repeaters in the field as well as help manage the size and capability of the WiMAX network architecture

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$13,768

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$2,754	\$2,754	\$2,754	\$2,754	\$2,754





NYSEG

Telecomm Infrastructure

Category:	Common – Operational Technology
Business Area:	Common

Responsible Group: OPTECH

Scope:

This project will continue to deploy and expand telecom infrastructure in order to enhance communications capabilities and connectivity throughout the NYSEG territory for distribution automation and monitoring activity.

Reasons and Benefits:

Expand network communications infrastructure for improved capacity, reliability and functionality for operation of gas/electric networks.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$27,804

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$16,272
2020	2021	2022	2023	2024
\$2,553	\$2,667	\$2,603	\$1,882	\$1,827





NYSEG

Telecomm Vertical Builds

Category:	Common – Operational Technology
Duciness Areas	

Business Area: Common

Responsible Group: OPTECH

Scope:

The building of vertical infrastructure is necessary to support our deployment of wireless and cellular technology.

Reasons and Benefits:

These towers will provide better overall coverage for wireless communications and reach for future technologies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,114

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$2,754	\$2,295	\$1,147	\$459	\$459





NYSEG

Fire Protection

Category:	Common - Security
Business Area:	Common

Responsible Group: Security

Scope:

Design and installation/replacement of smoke detector/fire alarm system, mass notification systems, automated extinguisher monitoring systems and fire suppression systems.

Reasons and Benefits:

Compliance with NFPA, local and federal laws; personnel life safety and asset protection.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$21,189

2015	2016	2017	2018	2019
\$0	\$529	\$1,538	\$4,339	\$2,908
2020	2021	2022	2023	2024
\$1,875	\$2,500	\$2,500	\$2,500	\$2,500





NYSEG Security Hardening

Category:	Common - Security
Business Area:	Common

IT

Responsible Group:

Scope:

This program focuses on enhancing end user protections, hardening firewalls, securing networking, improving patching, and strengthening IT security governance.

Reasons and Benefits:

This project will improve IT security from vulnerabilities such as Wannacry.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,825

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$350	\$357	\$365	\$373	\$380





NYSEG

System Cutover

Category:	Common - Security
Business Area:	Common
Responsible Group:	Security

Scope:

Design and installation of security network, access control and video monitoring systems.

Reasons and Benefits:

Compliance with NERC CIP, FERC, DHS and other security requirements; security of personnel and asset protection.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$153,421

2015	2016	2017	2018	2019
\$0	\$26,630	\$12,315	\$24,168	\$8,376
2020	2021	2022	2023	2024
\$16,229	\$20,465	\$31,144	\$8,456	\$5,637





NYSEG

Laboratory Equipment

Category:	Common - Other
Business Area:	Common
Responsible Group:	Customer Service

Scope:

Various types of lab and field measurement equipment for gas and electric measurement operations support.

Reasons and Benefits:

Equipment used by field personnel is required by PSC, ASTM, ANSI, and other entities to be calibrated and maintained to operate correctly when field personnel need to use it. The lab performs calibrations and repairs on this equipment. We need to purchase and upgrade lab equipment such as pressure calibration equipment, electric calibration equipment, and meter testing equipment for PSC and O&M safety regulations as well as measurement/metering regulations.

All amounts shown below in thousands for years 2015-2024

Total Proje	ect Cost:	\$1,928		
2015	2016	2017	2018	2019
\$0	\$299	\$546	\$90	\$293
2020	2021	2022	2023	2024
\$100	\$100	\$150	\$100	\$250





RG&E

Betterments

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

The Betterments program replaces various distribution system elements that contribute to high SAIFI measures. These projects focus on the reliability, operability and flexibility of the electric distribution system.

Reasons and Benefits:

Electric Betterments projects are focused on improving reliability of worst performing distribution circuits and maintaining delivery of electricity to our customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$37,077

2015	2016	2017	2018	2019
\$6,458	\$2,967	\$1,350	\$1,964	\$2,290
2020	2021	2022	2023	2024
\$4,153	\$4,278	\$4,406	\$4,538	\$4,674





RG&E Distribution Line

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

The Distribution Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric distribution system.

Reasons and Benefits:

This program maintains a reliable distribution system.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$85,243

2015	2016	2017	2018	2019
\$4,581	\$7,971	\$6,231	\$7,995	\$12,224
2020	2021	2022	2023	2024
\$8,710	\$8,971	\$9,240	\$9,517	\$9,803


RG&E

Distribution Line Inspection Repairs

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops

Scope:

The Distribution Line Inspection Repair program provides for the repair and replacement of assets required as a result of the Distribution Line Inspection program. The program alleviates potential reliability concerns proactively before system performance is affected. This program commonly replaces defective cross-arms, poles, cutouts, transformers, insulators, splices, etc.

Reasons and Benefits:

This program proactively replaces assets before system reliability is impacted by failure of system elements. This maintains reliable service to our customers that if not performed could lead to long outages and reduced system performance.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$14,081

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$2,652	\$2,732	\$2,814	\$2,898	\$2,985





RG&E Substation Circuit Breaker Replacement Program

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric

Responsible Group: Electric Ops

Scope:

This program replaces substation circuit breakers that have been identified as poor and very poor as identified by Asset Management as well as those breakers that have been identified as overdutied by Engineering.

Reasons and Benefits:

This program maintains a safe and reliability network and reduces the risk of damage to substation elements.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$32,799

2015	2016	2017	2018	2019
\$201	\$1,150	\$3,972	\$1,360	\$1,888
2020	2021	2022	2023	2024
\$3,974	\$4,076	\$4,178	\$4,284	\$7,717



RG&E

Transmission Line

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Electric Ops
Scope:	

The Transmission Line program consists of replacing reject poles, car hit poles, damaged conductors and similar unplanned, reactive work on the electric transmission system.

Reasons and Benefits:

This program maintains a reliable transmission system and addresses transmission line inspection deficiencies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,054

2015	2016	2017	2018	2019
\$1,079	\$907	\$255	\$618	\$934
2020	2021	2022	2023	2024
\$991	\$1,021	\$1,051	\$1,083	\$1,115





RG&E Add 35kV Circuit - Offload Circuit 778

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

This project will construct a 34kV line between Station 43 and 55 to offload Circuit 778. This is designed to improve the service reliability of Circuit 778 that runs between Station 42 – Station 43 – Station 55. Modifications may be required at existing substations if new bays are required.

Reasons and Benefits:

The base case, using the summer 2017 peak load of 1829MW, shows the 34.5kV Circuit 778 load will exceed its STE rating. This is an STE violation under System Normal conditions. It may be mitigated in the interim by shifting load, however, it must

be corrected to meet planning design criteria. Also noted, the contingency loss of the 34.5kV Circuit 778 will cause thermal overload on the 34.5kV normally open device 77802 upon transfer of load. A new line between Station 43 and Station 55 will eliminate the thermal stress on that device due to load transfer as well as remove the current overloading issues under normal, all lines in, conditions.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$134,484

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$697	\$77
2020	2021	2022	2023	2024
\$34,570	\$49,141	\$50,000	\$0	\$0





RG&E

Add 35kV Circuit (S42 - S420 - S62 - S85), Offload Circuit 780

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Construct a 34.5kV circuit to offload Circuit 780. The new circuit will parallel Circuit 780 (Station 42 - Station 420 - Station 62 - Station 85) and will have the same thermal capacity.

Reasons and Benefits:

Presently, the contingency loss of the 34.5kV Circuit 780 will cause thermal overload on the 34.5kV Circuit 759 upon transfer of load to this circuit. A new circuit operating in parallel with circuit 780 will reduce or eliminate the thermal stress on circuit 759 due to the load transfer. Presently, the exposure to thermal overload due to loss of circuit 780 is 480 hours/yr, affecting 2,631 customers and 28.1 MW of load.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$24,429

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$284	\$295
2020	2021	2022	2023	2024
\$100	\$750	\$10.000	\$13.000	\$0





RG&E

Cable Replacement C759-740

Category:	Asset Condition,	Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

The scope of this project is divided between two 34.5 kV circuits for Rochester Gas & Electric. The project scope for Circuit 740 is to replace an aged 0.75-mile nitrogen gas filled cable that is overhead in the Town of Perinton and Village of East Rochester. The rebuilt circuit will be overhead with open wire construction from Station 62 to pole T-16 and underground from manhole 668.54 to Station 117. The overhead segment distance is approximately 0.5 miles and the underground segment is approximately 0.25 miles.

The project scope for Circuit 759 is to replace approximately 1.65 miles of an aged nitrogen gas filled cable that is both underground and overhead in the town of Penfield. The rebuilt circuit will be underground for a total distance of about 1.6 miles from Station 85 to Whalen Rd, the remaining 250 feet is above ground.

Reasons and Benefits:

A two person contract crew monitors the use of nitrogen on the system and replaces nitrogen tanks as required. Replacement of these cables will eliminate annual maintenance cost \$200,000 for this work.

The Poor and Very Poor rated cable segments are comprised of older (1960's and 1970's vintage) non-tree retardant XLP cable, the gas filled aerial cable on Circuits 740 and 759, and the direct buried gas filled aerial cable on the Circuit 759. The gas filled cables on the Circuits 740 and 759 are considered a priority for replacement by the Operations group, due to in service failures, the poor condition of the cables, and the ongoing maintenance costs associated with replacement of the leaking nitrogen gas.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$17,931





2015	2016	2017	2018	2019
\$0	\$0	\$382	\$1,415	\$3,994
2020	2021	2022	2023	2024
\$11,335	\$806	\$0	\$0	\$0





RG&E

Line 701 Upgrade - 34.5 kV

Category:	Asset Condition,	Reliability	y and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

The project will build a new 34.5kV circuit parallel to Circuit 701 (Station 56 - Station 53 - Station 111 - Station 115) that have the same thermal capacity it will resolve thermal overload on the 34.5kV Circuit 765 upon transfer of load upon the contingency loss of the 34.5kV Circuit 701.

Reasons and Benefits:

Overload on 34.5kV Circuit 701 will cause thermal overload on the 34.5kV Circuits 739, 764, and 765 upon transfer of load. The exposure is 2860 hrs/yr, affecting 3105 customers and 29.5 MW of load.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,488

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$345	\$518	\$3,450	\$5,175	\$0





RG&E

Line 726 Upgrade - 34.5 kV

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

The project will up-rate or build a parallel 34.5kV line to 34.5 kV Line 726 (Station 42 – Station 43) for a total summer LTE rating of at least 95 MVA. The project will resolve the 34.5 kV Circuit 726 (Station 42 – Station 43) thermal overload issue upon the loss of the 34.5kV Circuit 735 (Station 7 - Station 81).

Reasons and Benefits:

For the loss of 34.5 kV Circuit 735 (Station 7-Station 81), the 34.5 kV Circuit 726 (Station 42 - Station 43) becomes thermally overloaded. The exposure is 95 hrs/yr, affecting 6,813 customers and 13.1 MW of load.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$18,975

2015 \$0	2016 \$0	2017 \$0	2018 \$0	2019 \$0
2020	2021	2022	2023	2024
\$690	\$1,035	\$6,900	\$10,350	\$0





RG&E Line 754 - 34.5 kV

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

This project will replace existing poles, cross arms, conductor and hardware on the 34.5kV Transmission Line between Stations 80 to 249. The project is replacing assets that are in poor condition based on an assessment report. Additional scope definition will be prepared during conceptual engineering.

Reasons and Benefits:

Improve segments conditions. Both segments were assessed as poor and, after consultation with subject matter experts, recommend rebuilding both segments of the line by replacing poles, conductors, and appurtenances.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,351

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$330	\$495	\$1,576	\$4,950





RG&E Line 761 - 34.5 kV

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric

Responsible Group: Projects

Scope:

Build a new 34.5kV circuit parallel to circuit 761 (Station 82 - Station 118 - Station 75 - Station 740) and will have the same thermal capacity.

Reasons and Benefits:

Improve system operation

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,445

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$726	\$1,089	\$3,630





RG&E Lines 901, 902 and 744 Replacement

Catagory	Accet Condition	Poliobility	v and Pacilianav
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Business Area: Electric

Responsible Group: Projects

Scope:

The project involves reconstruction of Circuits 901, 902 and 744 underground between Station 82/Mortimer Station and Station 251. These circuits are currently mounted on degrading poles and structures or are located outside of RG&E right of way.

Reasons and Benefits:

RG&E's 115kV Circuit 901, which runs north 1.4 miles from National Grid Mortimer Station to RG&E Station 251 and 115kV Circuit 902 which runs north from Station 82 to Station 251 are located in the same right of way adjacent to each other. These circuits are constructed with wood poles and three-legged steel structures, both of which are degraded and in need of replacement. Circuit 744 also runs adjacent completely outside the RG&E ROW. All circuits along the ROW are at risk for damage from down trees, due to the zone of influence. Circuits 942/943/744 between Station 251 and 33 are on University of Rochester property, several NERC violations exist along this ROW. As a result, all circuits in these alignments will be installed underground.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$45,203

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$116	\$2,711
2020	2021	2022	2023	2024
\$125	\$250	\$2,000	\$20,000	\$20,000





RG&E Pilot Wire Replacement Project

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Proiects

Scope:

The purpose of this project is to replace the existing Pilot Wire (PW) cables located (for 25 lines) around the RG&E network with fiber optic cables and upgrade terminal equipment and associated protective relays. The existing PW are still in service and all effected relay channels will have to be upgraded and moved to either the RG&E SONET network or to a direct fiber connection.

Reasons and Benefits:

Copper pilot wire cables are no longer maintained and protective relay equipment on both terminals for these respective lines (25 overall) are electro-mechanical and are obsolete. In case of outages this would greatly impact RG&E's system reliability.

The Pilot Wire Replacement Program will improve the system reliability by replacing the electro-mechanical pilot wire relays currently connected with copper pilot wires, with microprocessor type relays, and migrating selected tones from the existing copper wire pair cables to the RG&E OC-48 SONET JMUX networks. This project will help to alleviate this condition and increase system reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$25,855

2015	2016	2017	2018	2019
\$733	\$511	\$666	\$2,091	\$2,549
2020	2021	2022	2023	2024
\$3,418	\$2,286	\$6,638	\$2,509	\$4,454





RG&E RGE Transmission Power Transformers Renewals

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

This program is the forecast for the replacement of substation transformers that have reached the end of their useful life and the purchase of spare substation transformers needed to provide that adequate back-up equipment is available for emergency replacements. In general,34/12kV 10/14MVA transformers are included in this program.

Reasons and Benefits:

This program will improve the reliability of the network by proactively replacing equipment prior to catastrophic failure requiring emergency replacements.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$5,000





RG&E

Station 5 - Modernization Project

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

Station 5 is a Hydro-Generation Plant located at 103 Seth Green Dr, Rochester NY in Rochester, NY. The substation is located and part of the plant. The project scope includes the replacement of the existing 11kV network's breakers, switches, reactors and associated protective devices. The existing equipment will be replaced by three (3) new 11kV GIS switchgear sections. The associated 11kV relays and controls will be microprocessor relays installed on the new 11kV switchgear and relay cabinets. Existing line series reactors will be replaced with the new reactors of the same sizes including the R-Y bus reactor. Existing generators grounding breakers, switches, resistors, old electromechanical relays will be replaced with new breakers, switches, resistors, and digital relays. Cable termination and the 11kV line cables upgrade leaving the station up to the first manhole is included within the scope of this project.

Reasons and Benefits:

There are 33 breakers installed at Station 5. Of the 33 installed, 25 are currently in service and are of 1950's vintage. There are operational limitations in place because the GE FH models cannot be maintained individually due to OSHA requirements for visual opens and grounding. Wooden panels cover the front of the breaker bays. All breakers are overdutied. The existing control system operates using electromechanical relays which limit the operation of the breakers and generator units.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$32,709

2015	2016	2017	2018	2019
\$1,318	\$1,455	\$2,654	\$882	\$2,288
2020	2021	2022	2023	2024
\$15,735	\$8,337	\$40	\$0	\$0







RG&E

Station 43 Modernization Project

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

The scope of this project is to replace transformer Banks #3 and #4 with two 34.5-12.5 kV, 22.4 MVA transformer banks. The project will also convert the existing 4.16 kV

distribution circuits 5328, 5329, 5330, 5331, 5332 & 5333 to 12.5 kV. Additional works includes the installation of new 34.5kV & 15kV GIS Switchgears inside of a new pre-fabricated building which will replace the existing control building, also a new battery system will be installed into the new building and two new 100kVA auxiliary service transformers will be also installed.

Reasons and Benefits:

The loading on the existing 6.25 MVA transformer banks #3 and #4 at Station 43 has reached 113% and 95% of their PLBN rating respectively during the summer peak of 2011.The transformers are older units, #3T was installed in 1950 and #4T was installed in 1953. The total peak loading at the station is above 12 MVA, attributable to the six circuits, three fed from each transformer. The station serves approximately 6,467 residential and commercial customers. Loss of either transformer places the other in a situation where it is loaded well above its LTE rating, which conflicts with Distribution Planning Criteria. The proposed larger transformer size will facilitate increase switching capabilities with adjacent circuits. The proposed transformer dual secondaries are required for future 4-12kV conversion of area distribution.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$41,318

2015	2016	2017	2018	2019
\$0	\$57	\$58	\$627	\$2,237
2020	2021	2022	2023	2024
\$9,139	\$6,651	\$6,338	\$13,174	\$3,037





RG&E

Station 46 - Replace #1 and #3 Transformer Banks

Category:	Asset Condition, F	Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

The project will replace transformer banks #1 and #3 at Station 46 with two 34.5-4.16x12.5 kV, 13.4/17.9/22.4 MVA transformer banks and will reconfigure existing 4kV circuits into 12kV circuits.

Reasons and Benefits:

The loading on the existing 6.25 MVA transformer banks #1 and #3 at Station 46 has reached 99% and 82% of their PLBN rating respectively during the summer peak of 2011. The total peak loading at the station has been 13 MVA for two consecutive years of 2012 and 2013. The station's six distribution circuits serve approximately 6,356 residential and commercial customers. Presently, loss of either transformer places the other in a situation where it is loaded well above its LTE rating, which conflicts with Distribution Planning Criteria.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$45,387

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$164	\$2,586
2020	2021	2022	2023	2024
\$3,428	\$6,546	\$9,043	\$14,455	\$9,165





RG&E

Station 49 - Transformer and Switchgear Replacement

Category:	Asset Condition,	Reliability and Resiliency
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Business Area: Electric

Responsible Group: Projects

Scope:

The scope of this project is to remove the decommissioned capacitor bank, replace existing of Transformer 3 (18.75 MVA) and Transformer 4 (18.75 MVA) with larger capacity transformers 5 and 6 20/26.6/33.3 (37.3) MVA and replace the existing 11kV metal-clad switchgear in the control building with a GIS. The execution of this project is sequenced out to utilize 2 mobile substations during the removals and the duration of construction with goal to minimize customer impact.

Reasons and Benefits:

Station 49 serves approximately 22MW of load which is 6230 customers which includes Bausch & Lomb and Rochester General Hospital. During high load periods, loss of one of the 34.5kV/11.5kV transformers at Station 49 results in overloading the other 34.5/11.5kV transformer above its Long term Emergency Rating (LTE) and voltages at sub-marginal levels. This would result in the shedding 2MW of load to relieve the overload on the remaining transformer. The period of exposure is approximately 400 hours per year. The criteria used for this project is the single contingency criteria for the transmission system that provides for loss of any element results in the remaining elements being below their long-term emergency rating.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,823

2015	2016	2017	2018	2019
\$588	\$916	\$1,240	\$1,581	\$3,292
2020	2021	2022	2023	2024
\$5,179	\$27	\$0	\$0	\$0





RG&E

Station 117 - Replace #1 Transformer Bank and Convert Circuits to 12kV Operation

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Projects

Scope:

Replace transformer bank #1 and associated gear with a new 34.5-4.16x12.5kV 20/26/33 (22.4) MVA Zig Zag Transformer Bank. All the modifications will be made inside the station and include transformer replacement and any upgrade required with the high side and low side equipment. The zig zag transformer will allow us to have the substation ready prior the conversion of all the distribution circuits from 4kV to 12.5kV. The project will also convert 4kV distribution equipment, potentially 266 distribution transformers and 23 miles of circuit conductors will need replaced or re-rated to 15kV. This option will have a significantly longer time line with the added 12kV distribution scope.

Reasons and Benefits:

The conversion to 12kV will enhance station capacity, and adjacent station 12kV circuit tie over for contingency. The larger transformer will improve system reliability by providing N-1 capacity to the station, and adjacent circuits that currently are without adequate circuit ties during high demand periods. The loading on the existing 5.25 MVA transformer bank #1 at Station 117 has reached 103% of its PLBN rating during the summer peak of 2013. The peak load data showed the 2013 with the highest peak, as 92% in 2011 and 2012, and a peak of 81% in 2016.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$21,611

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$87	\$1,461
2020	2021	2022	2023	2024
\$5,450	\$8,370	\$4,916	\$1,327	\$0





RG&E

Station 127 - 115 kV System Upgrade

Category: Asset Condition, Reliability and Resiliency

Business Area: Electric

Responsible Group: Projects

Scope:

Construction will occur at 961 Hook Road, Farmington, NY and will begin in April 2020. Construction scope includes a 34.5 KV duct bank, metering switchgear, creation of underground 34.5kV Lines 815 and 816 to customer National Fuel Gas, installation of one 75MVA transformer, will expand the 34.5 KV buses and provides redundant connection to Yard 127A.

Lines 815 and 816 will originate at Yard 127B and terminate at Station 9205 National Fuel Gas.

High potential voltage testing of new medium voltage cables and splices; point to point continuity and Megger testing of low voltage cable; functional testing of relays and alarm circuits will ensure service quality and reliability.

Reasons and Benefits:

Transmission Planning identified the need for a second 115/34.5 KV transformer at Station 127 and the cross-connect of 34.5 KV busses at Yards 127A and 127B. This project eliminates a proposed second 115/34.5 KV transformer at Station 121.

Station 121 and Station 127 are both located in Canandaigua Division of RG&E. Both stations are interdependent to each other and are connected via normally open tie points which are manually closed to transfer loads to the available source.

The reduced risk of losing the 34.5 KV sources at Station 121 or 127 provides an inclusive solution for both stations. Also, this strategy manages the additional 27.0 MW load for the National Fuel Gas Compressor facility.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$19,955





2015	2016	2017	2018	2019
\$0	\$0	\$0	\$17	\$1,622
2020	2021	2022	2023	2024
\$13,387	\$4,928	\$0	\$0	\$0





RG&E

Station	204	upgr	aue	

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric

Responsible Group: Projects

Scope:

Replace both 115/34 kV transformers with new summer rating of normal-78.7MVA /LTE-97.5MVA/STE-106.4MVA with LTC capability. This solution will not only solve the contingency transformer overload problem but will also boost the voltages in the area. All existing 34 kV breakers will be upgraded to GIS in a new control house.

Reasons and Benefits:

Loss of a 115/34.5kV transformer at Station 204, or loss of any (set of) 115kV and/or 34.5kV line(s) which causes one of the two transformers at Station 204 to be out of service, causes the remaining 115/34.5kV transformer to be thermally overloaded under peak load conditions.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$16,756

2015	2016	2017	2018	2019
\$0	\$17	\$18	\$23	(\$325)
2020	2021	2022	2023	2024
\$602	\$645	\$2,450	\$6,353	\$6,973





RG&E Station 210 - Transformer Replacement and Modernization

Category:	Asset Condition,	Reliabilit	y and Resiliency	,
			,	

Business Area: Electric

Responsible Group: Projects

Scope:

Refurbish substation by upgrading and replacing equipment with 50+ years in service, including upgrading breakers, relays.

Reasons and Benefits:

Station 210 contain infrastructure > 50 years in service. Equipment in poor condition, lacking spare parts, or require expense replacement parts. In addition, replacing failing or non-maintainable oil filled breakers with vacuum/SF6 breakers reduces environmental contamination potential; new controls with microprocessor based relays and high speed connections to the Energy Control Center reduces outage detection time; and maintenance cycles may be extended, reducing customer outages for maintenance. Motor operated equipment and additional monitoring that is provided by the new relay protection equipment also allows for system automation and remote operation, with potential to greatly reduce customer outage times and minimize affected areas.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,854

2015	2016	2017	2018	2019
\$1,016	\$188	\$138	\$189	\$647
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$10,676





RG&E

Resiliency Plan

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Processes & Technology

Scope:

The scope of the Resiliency project is to reduce the impact of severe weather to customers and improve overall SAIFI and CAIDI through 4 categories:

- 1. The top 400 circuits have been identified that impact 55% of the SAIFI.
- 2. The goal is to have common voltages for better tie points, reducing the number of customers on a circuit.
- 3. The project will also provide more automated sectionalizing and protection through automated recloser installations and SCADA switches.
- 4. In conjunction the plan is to harden the system by using larger diameter poles, tree aerial cable and, where possible, potentially undergrounding sections.

The goal is to have common voltages for better tie points, reducing the number of customers on a circuit and provide more automated sectionalizing and protection through automated recloser installations and SCADA switches.

Reasons and Benefits:

This program is focused on decreasing the frequency and length of outages experienced by our customers. The program will harden the system and increase the reliability of service to our customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$48,425

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$755
2020	2021	2022	2023	2024
\$6,670	\$8,260	\$10,200	\$10,540	\$12,000





RG&E

RGE - Resiliency Large Projects

Category:	Asset Condition,	Reliability and F	Resiliency
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Business Area: Electric

Responsible Group: Processes & Technology

Scope:

This is part of the original Resiliency Plan. The type of projects include:

- New Substation
- Upgrades Substation
- Upgrade Wire Section of Transmission Circuits
- Voltage Conversion of Circuits
- Upgrade wire section of Distribution Circuits"

Reasons and Benefits:

Avoided customer interruption costs represent the largest benefit stream. When customers experience interruptions, they bear economic costs. The Resiliency large project investments are designed to reduce the frequency and duration of interruptions and thus deliver economic benefits to customers.

Avoided restoration costs are benefits from restoring power to customers less frequently due to fewer outages in future years. Restoration costs consist of capital and O&M.

Avoided replacement costs are costs that would be incurred for replacing infrastructure in the absence of these Resiliency Projects. These apply to poles for distribution circuits and to infrastructure on two RG&E transmission lines.

Avoided maintenance costs apply in this analysis to the annual costs of maintaining RG&E gas-filled transmission cables.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0





2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$5,000





RG&E

Underground Cable Injection

Category:	Asset Condition, Reliability and Resiliency
Business Area:	Electric
Responsible Group:	Processes & Technology

Scope:

This project will treat XLP cable by injecting insulating fluid into existing XLP direct buried primary distribution cables installed between the years of 1970-1985.

Reasons and Benefits:

Asset Management completed an Underground XLP Cable Evaluation and Treatment Program Report for RG&E on July 12, 2017. It was recommended to develop and implement a program to treat XLP type cable and replace cable not suitable for injection. Cable failures are one of the equipment failures listed under the underground equipment and pad mounted transformer category and accounts for 33.6% of the RG&E customer interruptions based on notifications from 2008 to 2016. A cable injection program was implemented at RG&E between 2003 and 2013 treating about 2 million feet of XLP type cable. The Underground XLP Cable Evaluation and Treatment Program Reports estimates that reinstituting a cable injection program in conjunction with a replacement program will reduce RG&E SAIFI from 0.0183 to 0.0026 and CAIDI from 1.820 to 1.800 assuming other reliability impacts remain constant. Cable injection is completed in service, with no impact to customers, is performed with contractors and immediately improves reliability of the cable injected.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,849

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$589
2020	2021	2022	2023	2024
\$2,625	\$2,635	\$0	\$0	\$0





RG&E

New 115-12.5 kV Station on Manitou Road

Category:	Capacity
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Business Area: Electric

Responsible Group: Projects

Scope:

Install a new 115/12kV substation with a 12/16/20 (22.4) MVA at 55 C (65 C) transformer and three new circuits.

Reasons and Benefits:

This project will relieve Stations 69 and 71 and eliminate the need to increase the size of #1T at Station 70.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,300

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024





RG&E

Rochester Area Reliability Project -RARP

Category:	Capacity	
Business Area:	Electric	

Responsible Group: Projects

Scope:

A new 345kV BPS (bulk power system) station (Station 255) will be constructed and located approximately 3.8 miles west of the RG&E Station 80. The two NYPA 345kV cross-state transmission lines will be brought into the new station. A new 345kV line will be constructed between the new substation and Station 80. Two 115kV lines will emanate from the new substation; the first line (approximately 10 miles in length) will tie into Station 418, the second line (approximately 14 miles in length) will tie into the RG&E 115kV system at Station 23. An Article VII filing is required and has been filed with the NYPSC.

Reasons and Benefits:

Due to increasing load, a fourth source of supply into the RG&E service area is necessary in the event the Ginna nuclear plant experiences a long term outage. The Project will add a fourth source of supply by connecting to the NYPA 345kV cross state transmission lines. Total import capability will increase from 2507MW to 3307MW.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$343,800

2015	2016	2017	2018	2019
\$5,539	\$11,783	\$13,128	\$56,932	\$146,163
2020	2021	2022	2023	2024
\$104,378	\$5,877	\$0	\$0	\$0





RG&E Station 82 Upgrades

Category:	Capacity
Business Area:	Electric

Responsible Group: Projects

Scope:

Upgrade of the Station 82 – Mortimer 115kV tie to at least 3000 Amps (598 MVA) Summer Normal Rating and upgrade the 115kV breakers rated as poor and very poor by Asset Management. Upgrade the 115kV Line 902 to a Summer LTE rating of 594 MVA or greater.

Reasons and Benefits:

Project completion will avoid the cost of load loss and customer outage necessary to alleviate thermal overloads on Station 82 – Mortimer 115kV Tie under extreme contingency of losing Station 122 and will provide operational flexibility to ensure full utilization of the increased transformer capacity at Station 80. The upgrade of Line 902 will

avoid the cost of load loss and customer outage necessary to alleviate thermal overloads on Line 902 under contingency and removes the following violations: threshold for N -1 thermal violation is RG&E load of 1941 MW, corresponding to year 2023 and threshold for N -1-1 thermal violations is RG&E load of 1922 MW, corresponding to year 2022.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$83,277

2015	2016	2017	2018	2019
\$0	\$0	\$195	\$336	\$268
2020	2021	2022	2023	2024
\$15,899	\$11,701	\$28,433	\$14,193	\$12,251





RG&E

Station 156 Transformer and Facilities Upgrade

Category:	Capacity
Business Area:	Electric
Responsible Group:	Projects

Scope:

The project will replace the existing two transformers with one new 34/12kV, 10/12.5/14 MVA LTC type and update associated equipment. It will reconfigure existing 4kV circuits into 12kV circuits.

The overall condition of the station has a Health Index of poor as rated by Asset Management. The existing transformers, #1T 1.5MVA and #2T 3.75MVA have very small margins during peak loading periods. The 4kV circuit breakers all have Health Index of poor and spare parts are no longer available.

The new station will be installed with a gas insulated switchgear and breakers for both the 34.5kV feeders and 12kV distribution lines. The switchgear will be housed in a newly constructed control house. A new single 34.5-12kv, 10/12/14MVA transformer will replace the two existing units.

Reasons and Benefits:

The station requires a complete upgrade to provide system reliability and future load growth for the area. The conversion to 12kV will enhance station capacity and provide system reliability. The larger transformer will improve system reliability by providing N-1 capacity to the station and to adjacent circuits that currently are without adequate circuit ties.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$27,288

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$380	\$1,391
2020	2021	2022	2023	2024
\$4,140	\$7,944	\$10,154	\$3,279	\$0





RG&E

Station 168 - Service Area Reinforcements

Category:	Capacity

Business Area: Electric

Responsible Group: Projects

Scope:

This project will sectionalize National Grid 115kV Lines, Trunks 2 and 4 at Station 168. Associated work at Station 168 includes replacement of 115kV breakers, upgrading protection and control equipment as well as auxiliary systems. The line protection systems will be modified at the remote ends of Station 168 that includes RG&E Station 122, NYSEG Border City Substation, and the Niagara Mohawk Elbridge and Mortimer Substations. Remote end work includes replacing the existing circuit breaker in the Trunk 4 Bay order City, modifications and/or upgrades to the existing protection and controls system at the Border City Substation and replace both 115/34.5kV transformers at Station 168 with LTC banks having an LTE rating 100MVA or greater. The Station 168 transformers will be operated in parallel on the 34.5kV side.

Reasons and Benefits:

The basis for this project is to provide system contingency if and when Trunks 2 and 4 (National Grid), are lost under summer or winter peak conditions. The Trunks will also be sectionalized in order to avoid thermal overload on service systems and support transformer load leveling. Replacement of Transformers 1T and 2T Benefits of this project include sectionalization of Trunk 4 will ensure that the 12kV load at Station 168 is not dropped for a single-element contingency involving loss of either section of Trunk 4. Sectionalization of both Trunks 2 and 4 will ensure that the 34.4kV load at Station 168 is always shared by the two 115/34.5 kV transformers for any single-element contingency involving loss of either section of Trunk 7. Replacement of both 115/34.5kV transformers at Station 168 with larger LTC transformers and operating in parallel will ensure adequate thermal and voltage support under normal and contingency conditions.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$20,751





2015	2016	2017	2018	2019
\$207	\$220	\$341	\$1,311	\$5,370
2020	2021	2022	2023	2024
\$9,479	\$3,822	\$0	\$0	\$0





RG&E

Station 192 Upgrades

Business Area: Electric

Responsible Group: Projects

Scope:

The scope of the project is to replace the existing 34kV/4kV 1.5MVA(1500KVA) transformer with a 34kV/12kV 10/12.5/14 MVA transformer as the existing transformer experienced 113% rating of loading in 2013. The transformer supports three distribution circuits – circuits 215, 216 and C232- that will require upgrading from 4kV to 12kV. In addition, there will be upgrades to the remaining substation equipment to facilitate the new installation.

Reasons and Benefits:

The project will relieve the existing substation transformer that currently supports three distribution circuits. Converting the station from 4kV to 12kV will facilitate ties with adjacent transformers increasing the system's reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$15,214

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$97	\$1,278
2020	2021	2022	2023	2024
\$2,148	\$5,832	\$4,412	\$1,448	\$0





RG&E

BES Program - FERC Compliance

Category: (Compliance
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Business Area: Electric

Responsible Group: Projects

Scope:

As a result of the FERC Compliance Project to ensure RG&E is compliant with the FERC Brightline Order, System Planning has identified several new electric capital projects to be compliant with NERC Transmission Planning (TPL) Standards. These projects, to be managed under a comprehensive BES Program, include transmission line and substation modifications and upgrades. These include projects in the Rochester area.

BES is developing Detailed Engineering of the RGE projects to be executed in the next four years. BES is also working and filling the required Article VIIs between 2020 and 2021. *Reasons and Benefits:*

The program is required for regulatory compliance.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$97,428

2015	2016	2017	2018	2019
\$0	\$40	\$640	\$1,855	\$4,749
2020	2021	2022	2023	2024
\$12,210	\$20,171	\$14,433	\$8,097	\$35,233





RG&E NERC Alert Priority III

Ca	tegor	y:	Compliance
_	-	_	

Business Area: Electric

Responsible Group: Projects

Scope:

The scope of this project is to replace 115kV existing wood structure with a new wood structure, insulators, and cross arms and braces. In addition, the scope involves re-tensioning of conductor to address the clearance violation. The NERC Priority III is not a rebuild project and no new conductor is being replaced. Out of 15 lines, 10 lines were completed in 2019. The remaining 5 lines will be constructed in 2020. Guy anchor testing is being performed as part of this scope.

Reasons and Benefits:

RG&E must comply with the 2010 NERC Alert mandate to correct all conductors to ground clearances that do not meet NESC standards. Priority I & II line clearances were corrected by 2013. Priority III lines will be addressed in this phase of the project. The Priority III lines are all overhead 115kV transmission lines. There are 15 of these lines in RG&E with 109 Point of Interests, totaling 139 miles.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,610

2015	2016	2017	2018	2019
\$0	\$0	\$175	\$552	\$5,901
2020	2021	2022	2023	2024
\$1,000	\$1,000	\$1,000	\$1,000	\$1,981




RG&E

Government Highway

Category:	Customer	
Business Area:	Electric	
Responsible Group:	Electric Ops	

Scope:

This program relocates electric facilities that in conflict with highway and road projects being undertaken by municipalities and other government agencies.

Reasons and Benefits:

This work is required for the Company to remain in compliance with the terms and conditions to occupy public Rights of Way.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$13,497

2015	2016	2017	2018	2019
\$1,410	\$1,188	\$1,107	\$1,316	\$1,318
2020	2021	2022	2023	2024
\$1.373	\$1,402	\$1,431	\$1,461	\$1,491





RG&E

Industrial Commercial

Category:	Customer	
Business Area:	Electric	
Responsible Group:	Electric Ops	

Scope:

This program provides service connections for industrial and commercial customer. The cost the service is comprised of tariff portions as well as customer payments for amounts above the tariff required provision.

Reasons and Benefits:

This program is required to provide service requested by industrial and commercial customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$30,673

2015	2016	2017	2018	2019
\$1,697	\$2,944	\$2,702	\$2,417	\$2,688
2020	2021	2022	2023	2024
\$3.433	\$3.535	\$3.642	\$3.751	\$3.863





RG&E

Residential Line Extensions

Category:	Customer	
Business Area:	Electric	
Responsible Group:	Electric Ops	

Responsible Group:

Scope:

This program provides distribution line extensions and necessary facilities to provide service to residential development projects. This program provides the necessary equipment (transformers, conductors, conduit, hand holds, man holes, etc) to large scale residential projects. This program does not include the connection of individual residential units or meters.

Reasons and Benefits:

This program is necessary to meet our obligation to provide services to residential customers.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$33,692

2015	2016	2017	2018	2019
\$1,871	\$3,206	\$3,850	\$2,865	\$3,273
2020	2021	2022	2023	2024
\$3,508	\$3,614	\$3,722	\$3,834	\$3,949





RG&E

Service Connections

Category:	Customer		
Business Area:	Electric		

Responsible Group: Electric Ops

Scope:

Install new electric service to individual residential units where customers have requested service.

Reasons and Benefits:

Required to fulfill our obligation to serve non-industrial/non-commercial customers that request electric service.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$23,530

2015	2016	2017	2018	2019
\$2,118	\$2,076	\$2,035	\$2,607	\$2,651
2020	2021	2022	2023	2024
\$2,268	\$2,336	\$2,407	\$2,479	\$2,553





RG&E

Substation Automation Program

Category:	Modernization

Business Area: Electric

Responsible Group: Electric Ops

Scope:

This program installs and upgrades SCADA controlled equipment at substations.

Reasons and Benefits:

This program installs and upgrades SCADA controlled equipment at substations that allows remote monitoring and control of substation equipment. This equipment increases efficiency by reducing the need to send personnel to substations to investigate issues and take measurements/readings.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$30,612

2015	2016	2017	2018	2019
\$0	\$1,951	\$2,318	\$3,608	\$2,191
2020	2021	2022	2023	2024
\$3,639	\$3,870	\$3,947	\$4,008	\$5,081





RG&E

AMI

Category:	Modernization
Business Area:	Electric
Responsible Group:	OPTECH

Scope:

NY AMI will install smart meters and associated equipment in RG&E's territory.

Reasons and Benefits:

NY AMI is an essential foundational system in realizing REV goals to empower customers through new tools and information to effectively manage and reduce usage, establish and animate new markets to promote the implementation of DER's, and minimize environmental impacts of power generation and energy consumption. RG&E will gain early outage detection to assist with restoration efforts as well as streamline internal business processes.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$107,205

2015	2016	2017	2018	2019
\$0	\$23	\$23	\$351	\$240
2020	2021	2022	2023	2024
\$19.070	\$34,653	\$24,776	\$22,149	\$5,921





RG&E Non AMI DSIP ADMS

Category: Mode	rnization
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Business Area: Electric

Responsible Group: OPTECH

Scope:

The ADMS (Advanced Distribution Management Systems) will provide the ability to test distribution power flow, volt-var optimization, demand response, FLISR (Fault Location, Isolation, and Service Restoration), and DERMS (Distributed Energy Resource Management System).

Reasons and Benefits:

This project will be a continuation of the ESC ADMS development project. Once the ESC ADMS Project is complete there will be a scalability plan that will address releasing certain components to other NY Regional Offices.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$5,290

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$1,490	\$1,400	\$1,400	\$1,000	\$0





RG&E REV - Electric Vehicle Infrastructure

Category:	Modernization
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Business Area: Electric

Responsible Group: OPTECH

Scope:

RG&E pays for and owns 100% of the interconnection cost and behind the meter electrical infrastructure for new electric vehicle chargers. Includes 700 L2 chargers, 37 L3 chargers, and 10 bus chargers. RG&E would own 4 L3 chargers in underserved communities.

Reasons and Benefits:

This project supports the creation an environment that facilitates and supports the adoption of electric transformation within our service territories. In order to encourage the growth of the EV Market, sufficient charging infrastructure is necessary. Electrification of transportation is a key solution for de-carbonizing the economy.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,705

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$2,156	\$2,516	\$2,516	\$0	\$2,516





RG&E

Fossil Hydro Operations Minor Projects

Category:	Generation
0,	

Business Area: Generation

Responsible Group: Gen Del

Scope:

RG&E Hydro Operations implements minor capital projects each year to address both planned and emergent projects that typically have a per project cost less than \$200,000. The minor capital project funds are allocated to specific minor projects as they emerge.

Reasons and Benefits:

Projects are implemented for a variety of electrical, mechanical, civil/structural and regulatory type projects at all generating facilities including powerhouses, dams, intake houses, substations and project lands to: 1) install those necessary betterments to improve station reliability, unit efficiency, worker, public and project safety and site security 2) to achieve license/regulatory requirements 3) to replace end-of-life and obsolete equipment.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,050

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$587	\$1,963
2020	2021	2022	2023	2024
\$1,500	\$1,500	\$1,500	\$1,500	\$1,500





RG&E

Station 2 Modernization

Category:	Generation
Business Area:	Generation
Responsible Group:	Gen Del

. Scope:

This project is comprised of two phases:

Phase 1 involves removal of existing 11 foot diameter steel penstock, installation of new 14 foot diameter bifurcated steel penstock, fish bypass and trash chute systems. The existing penstock was installed circa 1903 and is at end of its life.

Phase 2 involves deepening of Browns Race approximately five feet and installation of a new 6.3MW turbine-generator, auxiliary operating systems and powerhouse.

Reasons and Benefits:

The benefits of this project include:

- increasing the existing water resources and infrastructure (dam, property, etc.)
- replaces infrastructure at the end of its life
- increases the capacity of the station by 6.3MW of renewable hydro generation
- enhances protection of aquatic species, expands public recreation along the Genesee River at High Falls - supports New York State's energy goals of 50% renewable energy and 40% reduction in greenhouse gas emissions by 2030
- supports the City of Rochester's Energy Plan / Green Initiatives.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$54,716

2015	2016	2017	2018	2019
\$48	\$288	\$424	\$752	\$1,392
2020	2021	2022	2023	2024
\$6,348	\$15,113	\$10,953	\$7,600	\$11,800





RG&E

Cabot Line Replacement

Category:	Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace approximately 33,000 feet of 14-inch leak prone main with approximately 33,500 ft of 8-inch (and smaller diameter) new main realigned along public ROW to serve existing customers. The project will contribute to the overall Leak Prone Main Replacement Program.

Reasons and Benefits:

The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The gas main replacements result in a distribution system that is safer and more reliable.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$500	\$500	\$0	\$0	\$0





RG&E

Caledonia Station Rebuild

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This project is to rebuild the Caledonia Gate Station. Anticipated work will involve a new building, equipment, valves, and associated pipe and fittings for flow and pressure control functions, odorization, and RTU monitoring. Work will also include electrical upgrades: a back-up generator, and exterior lighting on the property. Site and security work will also involve a new driveway extension and updated fencing and gates to meet current Avangrid security requirements.

Reasons and Benefits:

The Caledonia Gate Station is the primary gas supply source into the RG&E system, and supplies gas to the western and eastern portion of the franchise. The RG&E franchise requires upgrades to this gate station for safe, continuous and efficient operation in the midst of system growth and aging facilities and equipment. The upgrades and replacements associated with this project are necessary to avoid significant future maintenance and to prepare for the future 330 psig loop configuration of existing CM pipelines.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$18,374

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$192
2020	2021	2022	2023	2024
\$182	\$0	\$0	\$1,000	\$17,000





RG&E

CM-1 - Chili Gate Station to Ballantyne Rd, Transmission Gas Main Replacement Project

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace existing 22 1/2" gas mains parallel with CM-5 pipeline (Chili GS to Ballantyne Rd) with 23,400 feet - 16" WRST. This will require an Article VII application.

Reasons and Benefits:

The project addresses asset condition by replacing transmission pipe installed in the 1950s that has leak potential as identified by RG&E's IMP. The new pipeline will be designed to operate at less than 20% SMYS. The project is part of the long-term plan to maintain gas supply to the Rochester area and improve transmission system and distribution system reliability. This CM-1 pipeline replacement will also be designed and constructed for a MAOP of 250 psig, but operated at 120 psig with outlet of RS 500 at the Chili gate station. This pipeline will be tied-in to the MF120 Western Monroe, CM-1, and CM-5 at Paul Rd.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,432

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$282	\$371
2020	2021	2022	2023	2024
\$279	\$0	\$0	\$1,000	\$500





RG&E

CM-1 Transmission Gas Main Replacement Project

Category:	Asset Condition,	Reliability
Calegory:	Asset Condition,	Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace the CM1 existing 20 inch steel gas transmission main from Caledonia Gate Station to Empire West Chili Gate Station (about 43,000 feet) with 24 inch steel gas pipe to operate at a maximum allowable operating pressure of 330 psig. This will be a key component to creating a new dual supply 330 psig operating system from the Caledonia Gate Station to the New Empire West Chili Gate Station.

Reasons and Benefits:

The project addresses asset condition by replacing 1950s vintage transmission pipe that meets the IMP leak prone main criteria. The new pipeline will be designed to operate at less than 20% SMYS, which reduces the pipeline classification and regulatory requirements, increases safety and allows for inspection and cleaning by a typical pipeline inspection gauges. The increase in gas main size to 24-inch steel will improve the efficiency by which gas can flow from the Caledonia Gate Station north to the Buffalo Rd regulator stations, a central hub for gas distribution. Additionally, the 24-inch steel main will increase flexibility when managing peak gas flow conditions in winter months, and while handling repair and emergency procedures. The new pipeline will also be a key component to creating a new dual supply 330 psig operating system from the Caledonia Gate Station to the New Empire West Chili Gate Station, which will increase the safety and reliability of the RGE Rochester Gas Transmission System.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$55,824

2015	2016	2017	2018	2019
\$0	\$0	\$326	\$6,914	\$1,664
2020	2021	2022	2023	2024
\$6,420	\$20,000	\$20,000	\$500	\$0





RG&E

CM-1 Transmission Pipeline: Paul Rd to Buffalo Rd, Transmission Gas Main Replacement Project

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace existing 22 1/2" gas mains parallel with CM-4 pipeline (Paul Rd to Buffalo Rd) with 17,650 feet - 16" WRST. This will require an Article VII application.

Reasons and Benefits:

The project addresses asset condition by replacing transmission pipe installed in the 1950s that has leak potential as identified by RG&E's IMP. The new pipeline will be designed to operate at less than 20% SMYS. The project is part of the long-term plan to maintain gas supply to the Rochester area and improve transmission system and distribution system reliability. This CM-1pipeline replacement will also be designed and constructed for a MAOP of 250 psig, but operated at 120 psig with outlet of RS 500 at the Chili gate station. This pipeline will be tied-in to the MF120 Western Monroe, CM-1, and CM-4 at Buffalo Rd.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$12,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$2,000	\$3,000	\$7,000





RG&E

CM-1A Transmission Pipeline: CM-1 to Brockport, Replace Gas Mains

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace existing gas mains of the CM-1A, CM-1A-2, and CM-1A-2A with 46,400 linear feet of 20" WRST, 17,000 linear feet of 16" WRST, and 51,250 linear feet of 12" WRST; Install 21,800 linear feet of 16" WRST in existing RG&E ROW (Town of Ogden, Washington St - Gillette Rd); Install new regulators to support the following pressure systems: MF120 Western Monroe, MF60 Northwest, MF48 Gates. This will require an Article VII application.

Reasons and Benefits:

The project addresses asset condition by replacing transmission pipe installed in the 1950s that has leak potential as identified by RG&E's IMP. The new pipeline will be designed to operate at less than 20% SMYS. The project is part of the long-term plan to maintain gas supply to the Rochester area and improve transmission system reliability. This CM-1 pipeline replacement will also be designed and constructed to a MAOP of 330 psig and tie into the new CM-5 pipeline which will also have a MAOP of 330 psig. This will provide for long term growth on the RG&E transmission system and increase gas supply from the Caledonia Gate Station, Dominion Transmission Company. Reliability will also improve by looping this section of CM-1 with CM-5, CM-4 and CM-2.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$1,000	\$1,500	\$0	\$0





RG&E CM3D Transmission Pipeline - Route 441 to Whitney Rd, Install Gas Main

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This project includes the installation of approximately 25,000 linear feet of 16" WRST pipeline parallel to and 4 miles east of the existing CM3B pipeline. The project will also include the construction of a new district regulator station at Whitney and Swadling Roads and approximately 5,000 linear feet of 12" wrapped steel pipeline to connect to the existing MF120 Eastern Monroe System. This project will require an Article VII application.

Reasons and Benefits:

On design day, approximately three-quarters of all the gas on the RGE-Rochester East Side System travels through the northerly portion of CM3 & CM3B located along Salt Road, from Rte. 441. The northerly terminus of CM3B, located at Salt and State Road, is at 77% MAOP on design day, however, this figure drops to 70% MAOP (the design limit) for the range of operating conditions defined in the Gas Transportation Operating Procedures (GTOP) Manual. The pressure drop across the CM3B pipeline is the limiting factor for the East Side Supplier constraints. The proposed CM3D will improve system capacity, reliability, and reduce the supplier constraint on the east side of the RGE-Rochester System. The new pipeline will be designed to operate at less than 20% SMYS.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,131

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$282	\$349
2020	2021	2022	2023	2024
\$1,500	\$0	\$0	\$0	\$0





RG&E

Gas Distribution Mains - Replacements

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This is a minor program to replace gas mains as required due to asset condition, conflicts, and other identified field conditions.

Reasons and Benefits:

The work associated with this program is required to comply with various regulations and conditions identified in the field to address asset condition and safety.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,267

2015	2016	2017	2018	2019
\$731	\$453	\$830	\$782	\$1,389
2020	2021	2022	2023	2024
\$976	\$996	\$1,016	\$1,036	\$1,057





RG&E

Gas Operations General Equipment

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This is a minor program to replace tools and equipment within the Gas Operations area.

Reasons and Benefits:

This program allows the Company to meet safety and OSHA requirements by replacing tools and equipment at the end of their useful lives.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,201

2015	2016	2017	2018	2019
\$265	\$310	\$313	\$367	\$524
2020	2021	2022	2023	2024
\$273	\$278	\$284	\$290	\$296





RG&E

Gas Regulator Modernization & Automation Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This program replaces equipment that is obsolete or in poor asset or operating condition. Replacements include: regulators, filters, heaters, odorizers, backup generators, chart recorders, valves, inlet and outlet piping, enclosures, associated fittings, and corrosion protection. The program also includes automation of equipment such as: RTUs, Telog endpoints, and automated regulator operation as appropriate.

Reasons and Benefits:

This modernization and automation program improves system reliability, reduces maintenance costs, reduces potential outages due equipment failures, and improves equipment standardization and safety. Decreasing the capital allocated to this program increases the risk and reliability of gas distribution due to obsolete equipment in poor condition and lack of replacement parts. This can result in safety issues that impair or prevent annual inspections required by 16NYSCRR Part 255.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$30,861

2015	2016	2017	2018	2019
\$343	\$2,796	\$1,796	\$3,670	\$2,954
2020	2021	2022	2023	2024
\$2,820	\$3,998	\$4,079	\$4,161	\$4,245





RG&E

Leak Prone Main Replacement Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This program replaces leak prone gas mains identified as leak prone and includes mains replaced due to condition (DIMP and leaks) and municipal projects.

Reasons and Benefits:

The leak prone main replacement program improves distribution safety and reliability by replacing gas mains in poor asset condition at high risk for failure. The gas mains are prioritized for replacement in accordance with Distribution Integrity Management (DIMP) regulations and leak information. The gas main replacements result in a distribution system that is safer and more reliable.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$169,891

2015	2016	2017	2018	2019
\$13,987	\$15,158	\$13,915	\$14,352	\$13,512
2020	2021	2022	2023	2024
\$19,014	\$19,396	\$19,786	\$20,183	\$20,589





RG&E Leak Prone Services Replacement Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace leak prone gas services are required to be replaced by various regulations. This work includes but is not limited to: replacing gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way; leak prone gas main replacements per rate cases; tariff or code requirements; and actively leaking services.

Reasons and Benefits:

Leak prone gas services are required to be replaced by various regulations to keep customers and their properties safe from potential gas leaks.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$28,835

2015	2016	2017	2018	2019
\$1,643	\$2,483	\$2,536	\$2,753	\$2,066
2020	2021	2022	2023	2024
\$3,341	\$3,408	\$3,476	\$3,546	\$3,582





RG&E

Mendon Gate Station

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This Project includes upgrades to existing equipment and improvements to facilities, including: replacement of heaters; heater building HVAC and monitoring equipment upgrades; Regulation building HVAC and monitoring equipment upgrades; replacement of odorant tank and odorant injection lines; replacement of odorizor building; RTU building upgrades; generator replacement; upgrades to site security; additional Gas Control/ECC remote controls.

Reasons and Benefits:

This project will upgrade equipment, modernize facilities, increase operational efficiencies, eliminate potential environmental concerns, increase safety and security at a primary gate station feeding the eastern portion of the RG&E Rochester franchise that serves approximately 150,000 customers. These Mendon Gate Station improvements will provide a safe and reliable natural gas supply to customers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,182

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$182	\$0	\$0	\$1,000	\$1,000





RG&E

MF42 Henrietta: Brighton Henrietta Town Line Rd Improvement, Install Gas Mains

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install 6,418 feet of 12" plastic gas main, from existing 12" at Canal View Blvd west to 8" at East Henrietta Rd. Existing 12" gas mains that cross Route I-390 will remain.

Reasons and Benefits:

The existing pressure system is at 50% of maximum operating pressure on design day. The system is experiencing growth and lacks capacity to support additional load. There are known pending multi-purpose (a combination of residential and commercial) development (Winfield Park) that will begin construction within a few years and will draw upon the MF42 psig pressure system. The location of this project is along a congested commercial/industrial corridor with potential for growth.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,129

2015	2016	2017	2018	2019
\$0	\$5	\$0	\$12	\$12
2020	2021	2022	2023	2024
\$0	\$1,100	\$0	\$0	\$0





RG&E

MF60 Southeast Phase 1 (Mendon Gate - Route 64), Install Gas Main

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install approximately 13,100 linear feet of 12" WRST main, from the outlet of Regulator Station 428 (at the Mendon Gate Station), along NYS Rte. 64 to the intersection of NYS Rte. 251. The project will include the rebuild of Regulator Station 428 to accommodate the additional capacity. The project will also include crossing the NYS Thruway (I-90).

Reasons and Benefits:

The south easterly portion of the MF60 Southeast System, particularly the Towns of Victor and Farmington, is operating between 50-70% MAOP during peak conditions. The project is part of the long-term plan to increase the MF60 Southeast 60-psig pressure system capacity to improve system reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,115

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$115	\$2,000	\$0	\$0	\$0





RG&E

MF60 Southeast Phase 3 (Malone Rd), Install Gas Main

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install approximately 19,000 linear feet of 6" MDPE main along Dryer Road, Malone Road and Boughton Hill Road, from Willis Hill Road to NYS Rte. 441.

Reasons and Benefits:

The south easterly portion of the MF60 Southeast System, particularly the Towns of Victor and Farmington, is operating between 50-70% MAOP during peak conditions. The project is part of the long-term plan to increase the MF60 Southeast 60-psig pressure system capacity to improve system reliability.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,300

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$100	\$1,200	\$0	\$0	\$0



RG&E

MF120 Eastern Monroe, State Road, Install Gas Main

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This project includes the replacement of approximately 22,000 linear feet of 8" feeder main (FM-3) with 12" wrapped steel main on the MF120 Eastern Monroe System, along State Road from Five Mile Line Road/Plank Road to Salt Road. The existing 8" main along the route will be de-rated and tied over to the MF60 Northeast System. The existing 4" and 6" main (MF60 Northeast System) will be cut-dead.

Reasons and Benefits:

On design day, the endpoint pressure (which is the inlet to regulator stations 468-Browncroft and 470-Blossom) is at 61% MAOP. These two regulator stations directly feed, and account for approximately 25% of all the gas that travels through the MF60 Northwest Pressure System. The current 12", 16" and 20" MF120 Eastern Monroe mains located along Whalen Road, Browncroft Road and Blossom Road are operationally at their capacity. This project, in conjunction with the proposed CM3D

Project, will increase the MF120 Eastern Monroe endpoints to above 75% MAOP on design day conditions. This will increase capacity on the feeder main and downstream distribution systems to increase reliability and safety.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$6,250

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$250	\$6,000	\$0	\$0





RG&E

MF120 Western Monroe: FM Reinforcement Project, Section 1 (Union St A - Chili Ave - Chili Scottsville Rd), Install Gas Mains

Category:	Asset Condition,	Reliability
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Business Area: Gas

Responsible Group: Gas Ops

Scope:

Install 12,900 LF - 16" WRST (Chili Ave to Chili Scottsville Rd) along Stottle Rd, Stryker Rd, and Chili Scottsville Rd.

Reasons and Benefits:

This project is part of a long-term plan to improve feeder main and distribution system reliability. This new main installation will be designed for a MAOP of 120 psig. It will contribute to accommodation of long-term growth on the RG&E distribution system, and improve efficiency on the MF120 Western Monroe, MF60 Northwest, MF48 Gates, and their downstream pressure systems, and improve inlet pressure at the Buffalo Rd regulator station.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$1,000	\$4,000	\$4,000





RG&E

Mt Read SF115 psi, Replace Gas Mains

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This project replaces 5,000 feet of 1950's vintage 20" steel pipe on Mount Read Boulevard and Driving Park.

Reasons and Benefits:

The Mount Read Blvd corridor in the City of Rochester and town of Greece has experienced a large amount of growth in recent years on the SF115 Mt Read Blvd, MF60 Northwest and MF14 Greece pressure systems. In order to continue support of future developments, this project is necessary to distribute pressure efficiently on the SF115 system, and adequately supply the regulators that feed the MF60 Northwest and MF14 Greece systems.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,800

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$150	\$2 650	\$0





RG&E

Non-Leak Prone Services Replacement Program

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace or tie-over any service associated with a gas main replacement project that does not qualify as a leak prone service in accordance with DIMP.

Reasons and Benefits:

This work is required by various regulations. The work replaces gas services in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rightsof-way, leak prone gas main replacements per rate cases, tariff or code requirements, actively leaking services etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$26,728

2015	2016	2017	2018	2019
\$0	\$2,517	\$2,630	\$2,739	\$1,589
2020	2021	2022	2023	2024
\$3,308	\$3,374	\$3,442	\$3,511	\$3,618





RG&E

RG&E Transmission Short Segments, Install Gas Mains

Category: Asset Condition, Reliability

Business Area: Gas

Responsible Group: Gas Ops

Scope:

Replace short sections, each <50 linear feet of 20", 22.5", and 24" transmission main, located on the CM-1, CM-2, and CM2-B-CM1 pipelines (total 0.03 miles).

Reasons and Benefits:

Records must be kept for life of gas facilities by regulation. Records are incomplete for the total 0.03 miles of transmission main being replaced.

All amounts shown below in thousands for years 2015-2024

Total Project Cost:		\$1,000		
2015 2016		2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$200	\$200	\$200	\$200	\$200





RG&E

Gas Distribution Mains - New Installations

Category: Cu	stomer
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Business Area: Gas

Responsible Group: Gas Ops

Scope:

This is a minor program to install new gas mains to customers requesting gas service.

Reasons and Benefits:

This is a minor program necessary to remain in compliance with tariffs.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$22,444

2015	2016	2017	2018	2019
\$1,614	\$2,463	\$2,736	\$1,049	\$1,814
2020	2021	2022	2023	2024
\$1,753	\$2,672	\$2,726	\$2,781	\$2,837





RG&E

Gas Meters

Category:	Customer
Business Area:	Gas
Responsible Group:	Customer Service

Scope:

This program is for the purchase and installation of gas meters to replace existing, aged meters as they are removed from service as well as for new installations.

Reasons and Benefits:

Gas meters are exchanged for annual PSC required programs including statistical sampling and remediation programs and for other various reasons including relocation, load increases, meter damaged, special testing, replace non-tc meters. The programs ensure accurate recording of customers usage and result in accurate customer billing.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$28,070

2015	2016	2017	2018	2019
\$1,907	\$3,118	\$3,318	\$3,510	\$3,074
2020	2021	2022	2023	2024
\$2,100	\$2,144	\$2,300	\$2,600	\$4,000





RG&E

Incremental Customer Growth - Gas Related Projects

Category:	Customer
Category:	Customer

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This line item allocates capital funds for infrastructure related to serving new, emergent customers beyond typical tariff driven residential customer work. This includes the Pilot programs required by PSC order and new large commercial or industrial customers in accordance with tariff.

Reasons and Benefits:

This line item allocates capital funds for infrastructure related to serving new, emergent customers beyond typical tariff driven residential customer work. This includes new large commercial or industrial customers in accordance with tariff.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$11,450

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$2.219	\$2.264	\$2.310	\$2.357	\$2.300





RG&E

Install New Gas Services

Category:	Customer		
Business Area:	Gas		

Responsible Group: Gas Ops

Scope:

Install new gas services to new customers and replace gas services in conflict with street reconstruction projects.

Reasons and Benefits:

This program is necessary to connect businesses and residence that request gas service in accordance with tariffs.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$27,304

2015	2016	2017	2018	2019
\$6,076	\$3,006	\$1,736	\$1,459	\$1,690
2020	2021	2022	2023	2024
\$2,562	\$2,614	\$2,666	\$2,720	\$2,775





RG&E

Large Government Jobs

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This program replaces gas mains in conflict with street reconstruction projects in accordance with terms and conditions to occupy public rights-of-way.

Reasons and Benefits:

This is a program for work mandated by government entities and is necessary to comply with the terms and conditions to occupy public Right of Way.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$10,224

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$2,493	\$2,543	\$2,594	\$2,594




RG&E MF14 Greece: Lake Avenue (Port of Rochester), Install Gas Mains

Category: Customer

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This project installs 1,850 feet of 8" plastic main along Lake Avenue from Latta Road to Corrigan Street and 30 feet of 4" plastic service.

Reasons and Benefits:

The existing MF14 Greece gas mains cannot support the anticipated 90 mcfh load based on 75% diversity of a total 120 mcfh load for the Port of Rochester without planned gas main replacements and new installations. This gas main installation will move gas more efficiently to the new load, while maintaining system pressure above 50% of maximum operating pressure. This project serves to minimize the pressure drop from existing 8" gas mains to the Port of Rochester project site.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$2,500	\$0	\$0	\$0





RG&E Minor Government Jobs

Business Area: Gas

Responsible Group: Gas Ops

Scope:

This is a minor program to replace gas mains that may be in conflict with municipal street and highway projects.

Reasons and Benefits:

This is a program for work mandated by government entities and is necessary to comply with the terms and conditions to occupy public Right of Way.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,109

2015	2016	2017	2018	2019
\$430	\$592	\$764	\$415	\$1,573
2020	2021	2022	2023	2024
\$640	\$653	\$667	\$680	\$694





RG&E

AMI

Category:	Modernization
	-

Business Area: Gas

Responsible Group: OPTECH

Scope:

NY AMI will install smart meters and associated equipment in RG&E territory.

Reasons and Benefits:

NY AMI is an essential foundational system in realizing REV goals to empower customers through new tools and information to effectively manage and reduce usage, establish and animate new markets to promote the implementation of DER's, and minimize environmental impacts of power generation and energy consumption. RG&E will gain early outage detection to assist with restoration efforts as well as streamline internal business processes.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$61,399

2015	2016	2017	2018	2019
\$0	\$0	\$6	\$0	\$96
2020	2021	2022	2023	2024
\$8.024	\$19.098	\$16.253	\$14.082	\$3.840





RG&E

Building Projects and Space Management Projects

Category:	Common - Facilities

Business Area: Common

Responsible Group: General Services

Scope:

Provide new layouts, building systems and equipment in our facilities.

Reasons and Benefits:

To assure building reliability in support of all departments, improved safety, increased efficiency and the management of the office space.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,920

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$219	\$202
2020	2021	2022	2023	2024
\$500	\$500	\$500	\$500	\$500





RG&E

Facilities Projects

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services
Scope:	

Minor capital projects (\$1k to \$99k) improvements throughout the year.

Reasons and Benefits:

Improvements and upgrades to systems due to end of life or failures associated with mechanical, electrical, building structures, control systems etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$16,725

2015	2016	2017	2018	2019
\$0	\$1,554	\$2,944	\$3,027	\$0
2020	2021	2022	2023	2024
\$1,666	\$1,666	\$1,666	\$1,666	\$2,535





RG&E

Generator Upgrades

Category: Common - Facilities

Business Area: Common

Responsible Group: General Services

Scope:

Building improvement projects (capital projects) through the year.

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with backup generators, ATS, electric distribution system, etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$800

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$500	\$200	\$100





RG&E HVAC Upgrades

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

Building improvement projects (capital projects) through the year.

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with backup RTUs, AHUs, Heat Pumps, Drives etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,100

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$50	\$250	\$550	\$250





RG&E OMS Enhancements

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	OPTECH

Scope:

This project will continue the build out of the NY Siemens Spectrum system and the OMS systems. The NY Spectrum system enhancements consists of SCADA, TNA and Software upgrade work.

Reasons and Benefits:

The continued buildout of these systems is critical to realize the full benefits and efficiencies these systems provide.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,491

2015	2016	2017	2018	2019
\$0	\$0	\$650	\$741	\$475
2020	2021	2022	2023	2024
\$125	\$125	\$125	\$125	\$125





RG&E

Scottsville Rd Equipment Yard Upgrades

Category:	Common - Facilities
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Business Area: Common

Responsible Group: General Services

Scope:

Building improvement project

Reasons and Benefits:

Existing yard is gravel with poor drainage causing adverse conditions to access and store equipment and possess safety hazards for personnel.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$500

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$500	\$0	\$0	\$0	\$0





RG&E

Site Upgrades

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

Building improvement projects (capital projects) through the year.

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with storm drainage, pavement, site lighting, sidewalks, signage, landscaping, etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,050

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$600	\$950	\$500





RG&E

Telematics Replacement Project

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

To replace and install telematics devices in all AVANGRID owned vehicles.

Reasons and Benefits:

To retrofit telematics units to increase safety and security due to the ability to monitor driving behavior, reduce vehicle idling lowering fuel consumption and increase business efficiencies through vehicle tracking sites.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$796

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$796





RG&E

Unassigned Projects - Potential Operations Impact

Category:	Common - Facilities
Business Area:	Common
Responsible Group:	General Services

Scope:

Minor capital projects (\$1k to \$99k) improvements through the year.

Reasons and Benefits:

Project improvements to upgrade systems due to end of life or failures associated with mechanical, electrical, building structures, control systems etc.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$850

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$850





RG&E Fleet Light Duty Vehicle Leases

mon - Fleet

Business Area: Common

Responsible Group: Fleet

Scope:

This is a minor program to replace light duty fleet vehicles. Light duty vehicles include vehicles such as compact SUV, full-size pick-ups, half-ton vans and other vehicles with gross vehicle mass rating (GVMR) of under 10,000 pounds.

Reasons and Benefits:

The program replaces vehicles to maintain a reliable and safe fleet.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$11,276

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$2,256	\$2,210
2020	2021	2022	2023	2024
\$827	\$910	\$1,001	\$1,101	\$2,971





RG&E Fleet Purchase

Category:	Common - Fleet
Business Area:	Common
Responsible Group:	Fleet

Scope:

This is a minor program to replace medium and heavy duty fleet vehicles and vehicular construction equipment. Medium duty equipment includes vehicles such as dump trucks, stake trucks, step vans and other vehicles with a gross vehicular mass rating between 10,000 and 26,000 pounds. Heavy duty equipment includes vehicles such as bucket trucks, digger derricks, semi-tractor, large dump trucks and other other vehicles with a gross vehicular mass rating greater than 26,000 pounds. Vehicular construction equipment includes equipment such as back hoes, excavators, all terrain vehicles, forklifts, tracked digger, cargo trailers, flatbed trailer and pole dollies.

Reasons and Benefits:

The program replaces vehicles to maintain a reliable and safe fleet.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$32,310

2015	2016	2017	2018	2019
\$0	\$4,486	\$4,487	\$2,086	\$3,481
2020	2021	2022	2023	2024
\$3,735	\$3,741	\$3,746	\$3,752	\$2,796





RG&E

Client Project Requests and Integration Projects

Business Area: Common

Responsible Group: IT

Scope:

The program is a placeholder for business initiatives identified by the Networks business areas for future efficiency projects. During annual demand planning, new projects are identified by business stakeholders to implement automation and efficiency initiatives.

Reasons and Benefits:

This program allows for process improvements within the Companies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$21,645

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$3,591	\$4,224	\$4,309	\$4,396	\$5,124





RG&E

Database Lifecycle

Category:	Common - IT

Business Area: Common

Responsible Group: IT

Scope:

The scope of this project includes the following:

-Replacement of Physical Servers

-Wintel Hardware in alignment with the Wintel framework agreement

-Lifecycle Services

-Capitalization of existing out task services that will support the project.

-Reduces OPEX charges for Infrastructure Out-task Agreement.

-Software Licensing Database Software (Oracle, SQL etc.)

Reasons and Benefits:

The objective of this lifecycle project is to provide the business with current versions of Oracle and SQL Server instances in both the Rochester and Augusta locations. Deployments for both Oracle and SQL Servers.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,101

2015	2016	2017	2018	2019
\$0	\$0	\$104	\$98	\$207
2020	2021	2022	2023	2024
\$168	\$171	\$175	\$179	\$0





RG&E

Desktop Lifecycle

Category:	Common - IT
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Business Area: Common

Responsible Group: IT

Scope:

The project includes project management to include deployment strategy, client communication, and procurement of PCs in a timely manner.

Reasons and Benefits:

The primary purpose of the PC Lifecycle Replacement program is to standardize the desktops while executing the IT strategy. New PCs are more reliable, have more memory, and faster processing speeds, resulting in quicker response when utilizing multiple applications.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,253

2015	2016	2017	2018	2019
\$0	\$0	\$109	\$97	\$106
2020	2021	2022	2023	2024
\$180	\$184	\$188	\$192	\$196





RG&E

Disaster Recovery Lifecycle

- IT

Business Area: Common

Responsible Group: IT

Scope:

Disaster Recovery LC involves refresh of DR infrastructure (servers, storage, databases, networking, etc.) to enable the recovery or continuation for IT systems supporting critical business functions in the case of an event causes primary system to be unavailable.

Reasons and Benefits:

This program allows for backup of key processes within the Company.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,575

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$525	\$525	\$525	\$0	\$0





RG&E

Laptop Lifecycle

Category:	Common - IT
Business Area:	Common

Responsible Group: IT

Scope:

Devices at Networks are over 4 years old and outside the warranty period. Overall goal will be to achieve 4-year lifecycle refresh across all of Avangrid, however due to the large number of devices the scope of 2020 will be to refresh all devices over 4.5 years old and continue to reduce the aging devices in 2021. The goal of this project is to replace aged equipment at all Avangrid Networks Companies.

The project will start in Q1-2020 and end in Q4 of 2020.

Reasons and Benefits:

The primary purpose of the Laptop Lifecycle Replacement program is to standardize the desktops while executing the IT strategy. New laptops are more reliable, have more memory, and faster processing speeds, resulting in quicker response when utilizing multiple applications.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,420

2015	2016	2017	2018	2019
\$0	\$0	\$149	\$64	\$332
2020	2021	2022	2023	2024
\$175	\$175	\$175	\$175	\$175





RG&E

NetEng Lifecycle

Category:	Common - IT
Business Area:	Common

Responsible Group:

Scope:

Purchase of replacement network devices in support of the Corporate network, including Cisco Routers, Switches and Wireless Access Points for deployment throughout the ANET enterprise.

Reasons and Benefits:

The goal of this initiative is to replace obsolete and end of life telecommunications network devices on a recurring 7 year cycle, as required to:

- Address problematic devices
- · Address end of life/end of service devices

IT

- Ensure global alignment
- Update hardware to meet global security requirements as assigned
- Prepare for emerging technologies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,644

2015	2016	2017	2018	2019
\$0	\$0	\$163	\$59	\$262
2020	2021	2022	2023	2024
\$281	\$287	\$293	\$299	\$0





RG&E

NetSec Lifecycle

Category:	Common - IT	
Business Area:	Common	

IT

Responsible Group:

Scope:

Purchase of network security devices, as defined by Global Security blueprint: SSL Decryption, Sanboxing, NBA FW evolution continuation of Global QSR initiatives to further enhance the Company's network perimeter security to reduce risk of malicious activities.

Reasons and Benefits:

Enhance and/or refresh Corporate perimeter security, on a 5 - 7 year refresh cycle or as required to achieve global alignment, reduce risk associated with technical obsolesence (end of life/support as declared by the device manufacturer) and aged infrastructure and meet current required defense in depth standards.

All amounts shown below in thousands for years 2015-2024 Total Project Cost: \$991

2015	2016	2017	2018	2019
\$0	\$0	\$75	\$0	\$0
2020	2021	2022	2023	2024
\$117	\$120	\$122	\$125	\$432





RG&E SAP Enhancements

Category:	Common - IT
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Business Area: Common

Responsible Group:

Scope:

This project will deliver a suite of changes following SAP ECC technical upgrade and introduction of CRM 7.0 into RG&E to support AMI metering.

Reasons and Benefits:

This project will support the NY AMI project and changes following implementation.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,131

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$293	\$838	\$0





RG&E SMARTERWORKPLACE

Category:	Common - IT	
Business Area:	Common	

Responsible Group: IT

Scope:

This project involves a global software license and software assurance enterprise agreement for desktop, application, and system installations.

Reasons and Benefits:

The Company receives costs based on the price level established by the number of device installations throughout the global enterprise.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,944

2015	2016	2017	2018	2019
\$0	\$30	(\$17)	\$1,338	(\$24)
2020	2021	2022	2023	2024
\$0	\$1,295	\$0	\$0	\$1,322





RG&E

Storage Lifecycle

Category:		у:	Common - IT	
_		-	2	

Business Area: Common

Responsible Group:

Scope:

The scope of this project includes the following:

- Replacement of Storage Array devices,

IT

- Organic Growth Storage additions
- DS8886 array
- NetApp file capacity
- SVC capacity licenses
- Out of warranty support
- Avoids large OPEX expense
- Infrastructure Services Migration services for efficiency.

Reasons and Benefits:

The goal of this project is to provide organic growth to existing storage arrays, replacement of aging, out of warranty, storage devices, as well as the migration of all impacted systems to the new devices. Additionally, the project will be engaged with infrastructure preparations for Data Center Consolidation along with leveraging the use of SVC in storage management.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,935

2015	2016	2017	2018	2019
\$0	\$0	\$185	\$295	\$615
2020	2021	2022	2023	2024
\$353	\$360	\$368	\$376	\$383





RG&E

Toughbook Lifecycle

Category:	Common - IT
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Business Area: Common

Responsible Group: IT

Scope:

The project includes project management to include deployment strategy, client communication, and procurement of Toughbook in a timely manner.

Reasons and Benefits:

The primary purpose of the Toughbook Lifecycle Replacement program is to standardize the desktops while executing the IT strategy. New Toughbooks are more reliable, have more memory, and faster processing speeds, resulting in quicker response when utilizing multiple applications.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,211

2015	2016	2017	2018	2019
\$0	\$0	\$62	\$45	\$230
2020	2021	2022	2023	2024
\$168	\$171	\$175	\$179	\$182





RG&E Wintel Lifecycle

Business Area: Common

Responsible Group:

Scope:

The scope of this project includes the following:

IT

• Replacement of Physical Servers: Wintel Hardware Servers (Type 1, 2 and 3) in alignment with the Wintel framework agreement

• Lifecycle Services: Capitalization of existing out task services that will support the project.

Reduces OPEX charges for Infrastructure Out-task Agreement.

• Software Licensing: Wintel Software (Anti Virus, Hardening, etc.)

Reasons and Benefits:

The objective of this lifecycle project is to replace the Company Windows infrastructure that is aging on a recurring 7 year cycle. Data Center consolidations - infrastructure preparations and address Microsoft Enterprise Agreement (EA).

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$2,504

2015	2016	2017	2018	2019
\$0	\$0	\$147	\$191	\$780
2020	2021	2022	2023	2024
\$266	\$271	\$277	\$283	\$289





RG&E

Workload Management and Optimization

Common - IT

Business Area: Common

Responsible Group: IT

Scope:

Robotics Process Automation (RPA) refers to a type of automation (called a robot or bot) which interacts with computed coded software that enables the automation of repetitive, rulebased processes, mimics interactions of users and works across functions and applications. The RPA bot user (virtual employee) executes the job just as an AVANGRID employees would.

The goal of the project is to definite an RPA Strategic Program for Customer Service and to implement Bots to complete high value business processes.

Reasons and Benefits:

The project is introducing Robotics Process Automation for consistency and to free up manual resources for more value-added tasks focused on improving customer service.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$590

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$470	\$120	\$0	\$0	\$0





RG&E Unix Lifecycle

Category: Common - IT Business Area: Common

IT

Responsible Group:

Scope:

This investment project will purchase, provision, and integrate Unix server infrastructure to support lifecycle efforts. This effort will meet availability, performance and scalability requirements while following IT Infrastructure global standards.

Project efforts include: Assistance with Data Center Consolidation effort, replacement of aging hardware - devices that are currently off support, server capacity increase to meet growth demand.

Reasons and Benefits:

Provide organic growth to existing servers, replacement of aging, out of warranty servers, Firmware and OS patching. Additionally, this project will be engaged with infrastructure preparations for Data Center consolidation.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,487

2015	2016	2017	2018	2019
\$0	\$0	\$437	\$340	\$250
2020	2021	2022	2023	2024
\$472	\$482	\$492	\$502	\$513





RG&E NY AMI Lifecycle

Category:	Common - IT
Business Area:	Common

Responsible Group: OPTECH

Scope:

This project is a transition and implementation plan to cover infrastructure hardware, physical data center requirements, support agreements, internal and external resource alignment for the next Head End System lifecycle replacement.

Reasons and Benefits:

This project will address asset condition replacement, efficiency and strategic initiative for transitioning Head End System responsibility to Smart Grids.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,000

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$1,500	\$1,500





RG&E

Organic Growth ECC/XECS Systems

Category:	Common - IT
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Business Area: Common

Responsible Group: OPTECH

Scope:

This is a program to replace ECC/XECS systems.

Reasons and Benefits:

This program allows the Company to achieve critical systems uptime and cyber compliance targets.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$793

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$195
2020	2021	2022	2023	2024
\$144	\$148	\$151	\$154	\$0





RG&E

Energy Control Systems Infrastructure

Category: Common – Operational Techno

Business Area: Common

Responsible Group: OPTECH

Scope:

NY Energy Control Systems Infrastructure encompasses incremental hardware refresh activities and technology upgrades as well as improvements to Electric, Gas and Business Area systems.

Reasons and Benefits:

These improvements are necessary to keep support, security and reliability at appropriate levels required by the demands of high availability of SCADA environments.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,697

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$275
2020	2021	2022	2023	2024
\$158	\$158	\$158	\$750	\$200





RG&E

Historian and Analytic Upgrades Program

Category: Common – Operational Technology

Business Area: Common

Responsible Group: OPTECH

Scope:

Integrate the Energy Management System data into the PI Historian system.

Reasons and Benefits:

The project will improve user access to data in a secure and reliable manner. There will also be increased efficiencies for all users that require access to critical information and allow for cross operating company visibility to key information to make decisions.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,835

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$1,735	\$0	\$2,100	\$0





RG&E Siemens Spectrum Upgrade to V7

Category:	Common - IT		
Business Area:	Common		

Responsible Group: OPTECH

Scope:

This is the RG&E portion of the upgrade of Siemens Spectrum system to version 7. The Siemens Spectrum system provides EMS/SCADA/ADMS/OMS functionalities to operate the electric transmission and distribution systems in New York State.

Reasons and Benefits:

Spectrum 7 is the latest software version. Moving to the latest version will guarantee that we get the latest operating system, database and applications security patch. In addition, Spectrum 7 works on Linux which will allow the Company to span the hardware options.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$3,050

2015 \$0 2020	2016 \$0	2017 \$0	2018 \$0	2019 \$0
	2021	2022 \$50	2023 \$2,000	2024 \$1,000





RG&E

Telecomm Fiber

Category:	Common – Operational Technology
Business Area:	Common
Responsible Group:	OPTECH

Scope:

The purpose of purchasing fiber optic cable is to enhance our connectivity and create high bandwidth communications and backhaul points.

Reasons and Benefits:

This project will minimize the number of microwave hops and repeaters in the field as well as help manage the size and capability of the WiMAX network architecture

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$4,589

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$918	\$918	\$918	\$918	\$918





RG&E Telecomm Infrastructure

Category:	Common – Operational Technology
Business Area:	Common

Responsible Group: OPTECH

Scope:

This project will continue to deploy and expand telecom infrastructure in order to enhance communications capabilities and connectivity throughout the RG&E territory for distribution automation and monitoring activity.

Reasons and Benefits:

Expand network communications infrastructure for improved capacity, reliability and functionality for operation of gas/electric networks.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$14,022

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$8,682
2020	2021	2022	2023	2024
\$1,435	\$1,200	\$1,155	\$798	\$753





RG&E

Telecomm NY WAN Expansion

Category:	Common – Operational Technology	
Business Area:	Common	

Responsible Group: OPTECH

Scope:

NY WAN (Wide Area Network) Expansion involves WiMAX (Worldwide Interoperability of Microwave Access) Deployments to support automation activities at RG&E.

Reasons and Benefits:

The NY WAN Expansion project is a WiMAX area network conceptualized to support smart grid communication equipment deployments as an end-to-end solution to meet requirements for communication paths and provide flexible solution for the company.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$9,863

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$3,364	\$3,295	\$2,607	\$298	\$298




RG&E

Telecomm Vertical Builds

Category:	Common – Operational Technology
Business Area:	Common
Responsible Group:	OPTECH

Scope:

The building of Vertical Infrastructure is necessary to support our deployment of wireless and cellular technology.

Reasons and Benefits:

These towers will provide better overall coverage for wireless communications and reach for future technologies.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,114

2015	2016	2017	2018	2019	
\$0	\$0	\$0	\$0	\$0	
2020	2021	2022	2023	2024	
\$2.754	\$2,295	\$1,147	\$459	\$459	





RG&E

Laboratory Equipment

Category:	Common - Other			
Business Area:	Common			
Responsible Group:	Customer Service			

Scope:

Various types of Lab and Field Measurement Equipment for gas and electric field and measurement operations support.

Reasons and Benefits:

Equipment used by field personnel is required by PSC, ASTM, ANSI, and other entities to be calibrated and maintained to operate correctly when field personnel need to use it. The lab performs calibrations and repairs on this equipment. We need to purchase and upgrade lab equipment such as pressure calibration equipment, electric calibration equipment, and meter testing equipment for PSC and O&M safety regulations as well as measurement/metering regulations.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,426

2015	2016	2017	2018	2019
\$0	\$183	\$114	\$105	\$184
2020	2021	2022	2023	2024
\$140	\$200	\$150	\$150	\$200





RG&E

Non AMI DSIP Advanced Planning Tools

Category:	Common - Other			
Business Area:	Common			
Responsible Group:	OPTECH			
Cooner				

Scope:

The scope of this project is to develop a model that can assess the cost-effectiveness of AVANGRID's electric and gas energy efficiency (EE) programs, Non Wire Alternatives (NWA) and Non pipe alternatives (NPA) projects, leveraging the cost-effectiveness approaches specified in the Benefit Cost Analysis Handbook (BCAH) developed and filed as part of AVANGRID's Distributed System Implementation Plan (DSIP) filing with the New York Public Service Commission (NY PSC).

Reasons and Benefits:

This tool will further increase efficiency and reduce the amount of time required for the evaluation of NWA /NPA projects and enhance the company's ability to assess the cost-effectiveness of an NWA/NPA solution to meet an identified system need. This tool will facilitate a consistent, more efficient approach to analyze proposals received though a competitive solicitation process using the BCA Handbook's methodology. The software tool will be delivered via the Analytica Cloud Player, a web-hosted platform that can be accessed online using a username and password, which can avoid the need to install the software tool on an AVANGRID desktop computer.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,577

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$0	\$0	\$0	\$0	\$1,577





RG&E

Fire Protection

Category:	Common - Security			
Business Area:	Common			
Responsible Group:	Security			

Scope:

Design and installation/replacement of smoke detector/fire alarm system, mass notification systems, automated extinguisher monitoring systems and fire suppression systems.

Reasons and Benefits:

Compliance with NFPA, local and federal laws; personnel life safety and asset protection.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$7,948

2015	2016	2017	2018	2019	
\$0	\$71	\$383	\$1,225	\$777	
2020	2021	2022	2023	2024	
\$1,132	\$1,090	\$1,090	\$1,090	\$1,090	





RG&E Security Hardening

Category: Common - Security

Business Area: Common

Responsible Group: IT

Scope:

This program focuses on enhancing end user protections, hardening firewalls, securing networking, improving patching, and strengthening IT security governance.

Reasons and Benefits:

This project will improve IT security from vulnerabilities such as Wannacry.

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$1,043

2015	2016	2017	2018	2019
\$0	\$0	\$0	\$0	\$0
2020	2021	2022	2023	2024
\$200	\$204	\$208	\$213	\$217





RG&E

System Cutover

Category:	Common - Security
Business Area:	Common
Responsible Group:	Security

Scope:

Design and installation of security network, access control and video monitoring systems

Reasons and Benefits:

Compliance with NERC CIP, FERC, DHS and other security requirements; security of personnel and asset protection

All amounts shown below in thousands for years 2015-2024 **Total Project Cost:** \$65,726

2015	2016	2017	2018	2019
\$0	\$3,535	\$7,116	\$11,190	\$3,841
2020	2021	2022	2023	2024
\$8,994	\$10,910	\$12,727	\$4,448	\$2,965





March 31, 2020

NYSEG and RG&E Capital Investment Plan

NYSEG and RG&E / INVESTMENT PLANNING / FIVE YEAR PLAN

Appendix C: Capital Project Lists by Category 2020-2024





Exhibit 13 NYSEG Electric Capital Project List (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Customer						
Residential Line Extensions	New Connections	\$ 8,430	\$ 8,683	\$ 8,943	\$ 9,212	\$ 9,488
Industrial Commercial	New Connections	5,495	5,660	5,830	6,005	6,185
Service Connections	New Connections	5,357	5,518	5,684	5,854	6,030
NYSEG Electric Meters - Program	New Connections	900	600	600	600	1,500
Government Highway	State & Municipal	4,081	4,203	4,329	4,459	4,593
Street Lighting	Customer Lighting	6,306	6,495	1,625	1,674	1,724
Subtotal		30,569	31,159	27,011	27,803	29,519
Capacity						
Coopers Corners, Add Third 345/115kV Transformer	Substation New and Upgrades	5.395	11.097	15.462	28.653	9.742
Hilldale - 115 kV Source	Substation New and Upgrades	787	4.723	14.168	11.806	-
Sloan - Add Second Transformer Bank and Fourth Circuit Position	Substation New and Upgrades	-	685	4,111	12,332	10,276
Carmel Add Second 115/46 kV Transformer	Substation New and Upgrades	1,249	3,747	4,997	8,744	6,246
Wood Street, Add Third 345/115 kV Transformer	Substation New and Upgrades	1,250	12,255	8,481	-	-
Roll Road Add Second 115/34.5kV Transformer	Substation New and Upgrades	950	2,849	3,799	6,648	4,749
Lyon Mountain Replace Second 115/34.5kV Transformer	Substation New and Upgrades	908	2,725	3,634	6,359	4,542
North Broadway Add Second 115/34.5 kV Transformer	Substation New and Upgrades	-	674	2,023	2,698	4,721
Dingle Ridge - Add Second Transformer and 13.2kV Conversion	Substation New and Upgrades	7,001	-	-	-	-
Morningside Heights - 2nd Transformer Bank, 3rd circuit	Substation New and Upgrades	-	-	-	-	5,481
Northend New 2nd 115/34.5kV Transformer	Substation New and Upgrades	122	732	2,197	1,830	-
Orchard Park - Add a Second Transformer Bank	Substation New and Upgrades	-	-	-	-	4,115
State Street New 2nd 115/34.5kV Transformer	Substation New and Upgrades	-	-	-	941	2,824
Watercure Rd Add Second 345 kV Transformer	Substation New and Upgrades	2,285	-	-	-	-
Java - Add Second Transformer and 12 kV Conversion	Substation New and Upgrades	-	-	-	-	1,865
North Endicott 115/34.5 kV Transformer B1 & B2 Replacement	Substation New and Upgrades	-	-	-	-	1,634
Pawling New 3rd 115/46kV Transformer	Substation New and Upgrades	-	-	-	-	1,611
South Perry - New 230/115kV Transformer	Substation New and Upgrades	/3/	-	-	-	-
North Brewster Reinforcement (formerly Silo Ridge Field Club)	Large Capacity Projects	6,674	-	-	-	-
Java Peak Shaving		1,083	597	610	624	-
Subtotal	NWA	240	40 335	200 50 735	80.895	58 070
oublota		20,000	-10,000	00,700	00,000	00,070
Asset Condition, Reliability, Resiliency						
Substation Circuit Breaker Replacement Program	Substation Rebuild	17,316	17,664	18,019	18,381	18,750
Substation Modernization	Substation Rebuild	5,000	10,000	10,000	10,000	40,000
New Gardenville Rebuild	Substation Rebuild	735	12,757	20,444	8,532	-
Substation Minor Capital	Substation Rebuild	7,147	7,252	3,749	3,451	5,937
Homer City Capital Breakers	Substation Rebuild	6,257	3,639	5,310	-	-
Substation Battery Replacement Program	Substation Rebuild	1,020	1,041	1,062	1,083	1,105
Sackett Lake Substation Rebuild	Substation Rebuild	4,813	5	-	-	-
Mobile Replacement #4	Substation Rebuild	3,141	-	-	-	-
NYSEG Mobile #2 Replacement	Substation Rebuild	3,141	-	-	-	-
Pound Ridge New 5 MVAR Switched Capacitor Bank	Substation Rebuild	-	613	1,379	1,073	-
Goulds Pump New 2.4 MVAR Switched Capacitor Bank	Substation Rebuild	-	468	1,052	819	-
Shortcut Road New 34.5kv, 5MVAR Switched Capacitors	Substation Rebuild	-	-	-	561	1,262
Betterments	Betterments	10,115	10,328	10,545	10,766	11,352
Bulkhead - Replace Transformer Bank #2 & #1	Transformer Replacement	-	-	565	3,392	10,177
Northside 115/34.5kV Transformer B1 and B2 Replacement	Transformer Replacement	531	1,593	2,124	3,717	2,655
Willet - Install Second Transformer	Transformer Replacement	1,932	-	-	-	-
Marcellus Transformer Bank Replacement and 12 kV conversion	Transformer Replacement	-	-	-	-	685
Whig Street Transformer Bank Replacement and 12 kV Conversion	Transformer Replacement	-	-	-	-	658
west Patterson 13.2kV Transformer Bank Replacement	Iransformer Replacement	-	-	-	-	375
Distribution Line Inspection Repairs	Distribution Line Inspection (DLI)	12,731	13,113	13,506	13,911	14,329
Distribution Line	Conductor Replacement	21,469	22,113	22,777	23,460	24,164
LINE 968 115 KV Rebuild	Conductor Replacement	1,400	2,799	27,993	27,993	27,993
Iransmission Line	Conductor Replacement	15,914	16,391	16,883	17,389	17,911
Line 589 34.5kV Rebuild	Conductor Replacement	-	831	1,247	8,310	10,388
Line 810 Brewster 46 KV Kebulid	Conductor Replacement	6 0 4 0	1,031	6,870	10,305	-
	Conductor Replacement	6,948	6,987	3,535	-	-

AVANGRID / INVESTMENT PLANNING

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Exhibit 13 NYSEG Electric Capital Project List – cont'd. (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Asset Condition, Reliability, Resiliency - cont'd.						
Line 962 - 115kV Rebuild	Conductor Replacement	-	-	-	-	14,300
Line 593 34.5kV Rebuild	Conductor Replacement	-	438	657	4,380	6,570
Line 807 Rebuild - 46 kV - South New Berlin to New Berlin	Conductor Replacement	219	329	2,190	3,285	4,928
Line 805 Rebuild Wassaic to Ten Mile River	Conductor Replacement	345	518	3,450	5,175	-
Line 810 Oneonta - 46 kV	Conductor Replacement	-	257	428	2,565	5,301
Line 560 - 34.5 kV	Conductor Replacement	-	252	420	2,520	5,208
Line 561 - 34.5 kV	Conductor Replacement	-	248	413	2,475	5,115
Line 803 Rebuild - 46 kV - Kent to West Appleton	Conductor Replacement	297	446	2,970	4,455	-
Line 879 Rebuild - Ausable Town Line to Rainbow Falls	Conductor Replacement	7,127	-	-	-	-
Line 802 Brewster 46 kV Rebuild	Conductor Replacement	231	347	2,310	3,465	-
Line 890 Rebuild	Conductor Replacement	3,835	2,280	-	-	-
Line 802 Oneonta - 46 kV	Conductor Replacement	-	222	333	2,220	3,330
Line 626	Conductor Replacement	149	248	1,485	3,755	-
Line 348 - 34.5 kV	Conductor Replacement	-	158	263	1,575	3,255
Line 347 - 34.5 kV	Conductor Replacement	-	158	263	1,575	3,255
Line 807 - 46 kV - Katonah Tap to Bedford Hills	Conductor Replacement	-	158	263	1,575	3,255
Line 620 - 34.5 kV	Conductor Replacement	149	248	1,485	3,069	-
Line 590 - 34.5 kV	Conductor Replacement	-	135	225	1,350	2,790
Seneca Lake L595 Submarine Cable Rebuild	Conductor Replacement	3,125	-	-	-	-
Line 542 - 34.5 kV	Conductor Replacement	-	81	135	810	1,674
Line 885 Rebuild 46kV	Conductor Replacement	1,913	-	-	-	-
Line 430 - 34.5 kV	Conductor Replacement	-	-	-	540	810
Line 803 - Kent to Tilly Foster	Conductor Replacement	1,158	-	-	-	-
Line 810 Rebuild - East Norwich to Oxford	Conductor Replacement	1,069	11	-	-	-
Line 806 - 46 kV	Conductor Replacement	-	59	98	585	-
Line 982 - 115 kV	Conductor Replacement	-	-	-	-	658
Line 510 - 34.5 kV	Conductor Replacement	-	-	-	180	300
Line 341 - 34.5 kV	Conductor Replacement	-	19	94	263	-
Resiliency Plan	Resiliency	19,895	24,640	30,600	31,960	35,000
NYSEG - Resiliency Plan Large Projects	Resiliency	-	-	-	-	10,000
NYSEG Electric Adjustment	Other Asset Condition	38	-	-	-	-
Subtotal		159,846	159,869	215,138	240,919	293,487
System Operations						
General Equipment Operations T&D	Operations	1,167	1,202	1,238	1,276	1,314
General Equipment - OPS-SO	Operations	365	373	380	388	566
General Equipment - ECC	Operations	156	160	163	166	-
Storm Restoration	Storm Restoration	581	598	616	635	654
Subtotal		2,269	2,333	2,398	2,465	2,534
Compliance						
BES Program - FERC Compliance	BES	52,132	97.339	85.246	49,301	116.354
NERC Alert Priority III	NERC Alert	9,108	9,108	9,108	9,108	11,436
Subtotal		61,240	106,447	94,354	58,409	127,790

AVANGRID / INVESTMENT PLANNING

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Exhibit 13 NYSEG Electric Capital Project List – cont'd. (\$ in thousands)

Description	Cub Catagoria	Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
						0.000
Distributed Energy Resource Management System (DERMS)	Business Systems	-	-	-	-	3,000
	Business Systems	-	-	-	-	2,477
NYSEG Communications for Automation Programs	Business Systems	200	203	206	209	432
	AMI	42,663	83,971	62,382	51,223	13,702
Non-AMI DSIP Grid Automation	DSIP	31,551	32,873	33,176	36,720	43,025
Substation Automation Program	DSIP	10,916	11,609	11,841	12,023	10,524
Java NWA-Microgrid	DSIP	1,000	15,800	10,000	-	
Electric Vehicles	DSIP	4,717	5,617	5,617		5,617
Non AMI DSIP ADMS	DSIP	1,808	1,700	1,700	3,000	-
Non AMI DSIP Enterprise Analytics	DSIP	1,220	1,842	975	-	-
AM&P REV Support NYSEG - Capital	DSIP	513	513	513	513	513
Non AMI DSIP Advanced Planning Tools	DSIP	-	-	-	-	1,577
Interconnection Services	DSIP	478	-	-	-	-
Hosting Capacity	DSIP	-	152	-	-	-
Demo Projects	DSIP	8	-	-	-	-
Energy Smart Community	Energy Smart Community	843	283	-	-	-
Energy Smart Community	Energy Smart Community	-	-	-	-	223
Subtotal		95,915	154,562	126,410	103,688	81,089
Generation						
Mechanicville Hydro Spillway Resurfacing	Generation Asset Condition	150	2,850	2,900	2,900	50
Kent Falls Upgrade	Generation Asset Condition	5,186	-	-	-	-
Mill C Intake Trash Rack & Rack Raker Project	Generation Asset Condition	3,398	-	-	-	-
High Falls U1 T-G Major Rebuild	Generation Asset Condition	75	100	1,420	874	200
Mill C Switchgear and Generator Protection	Generation Asset Condition	-	-	-	-	1,250
Rainbow Falls Penstock Replacement with Air Admission System	Generation Asset Condition	-	-	-	-	1,000
Kents Falls U3 T-G Major Rebuild	Generation Asset Condition	-	-	-	-	950
Kents Falls Unit 1 Major Rebuild (with mechanical seal)	Generation Asset Condition	-	-	-	-	700
Mechanichville Post Relicensing Requirements	Generation Asset Condition	-	-	-	-	516
Mill C Trash Sluice Gate Project	Generation Asset Condition	25	225	250	-	-
High Falls Draft Tube Stop logs	Generation Asset Condition	450	-	-	-	-
Mill C Intake Stop Gate Upgrade Project	Generation Asset Condition	25	375	50	-	-
Mill C Floodgate Upgrade Project	Generation Asset Condition	25	375	-	-	-
Mechanicville Relicensing - 2021	Generation Asset Condition	164	141	-	-	-
Mill C Gate Bulkhead Stability Project - Section 3	Generation Asset Condition	25	225	-	-	-
High Falls Trashrack and Rack Raker Upgrades	Generation Asset Condition	-	-	-	-	175
High Falls U2 T-G Major Rebuild	Generation Asset Condition	-	-	-	-	100
Mill C U3 T-G Major Rebuild	Generation Asset Condition	-	-	-	-	75
Mill C Powerhouse A	Generation Asset Condition	-	-	-	-	50
Kents Falls Low Level Floodgate	Generation Asset Condition	-	-	-	-	50
Upper M'ville U1 T-G Major Overhaul / Rebuild	Generation Asset Condition	-	-	-	-	50
Upper M'ville U2 T-G Major Overhaul / Rebuild	Generation Asset Condition	-	-	-	-	50
Kent Falls Improvements	Generation Asset Condition	29	-	-	-	-
Mill C U2 T-G Major Rebuild	Generation Asset Condition	-	-	-	-	25
Fossil Hydro Operations Minor Projects	Generation System Operations	1,500	1,500	1,500	1,500	1,500
Subtotal		11,052	5,791	6,120	5,274	6,741

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Exhibit 14 RG&E Electric Capital Project List (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Customer						
Residential Line Extensions	New Connections	\$ 3,508	\$ 3.614	\$ 3,722	\$ 3,834	\$ 3,949
Industrial Commercial	New Connections	3,433	3.535	3.642	3.751	3.863
Service Connections	New Connections	2,268	2.336	2,407	2.479	2,553
RGE Electric Meters - Program	New Connections	600	300	300	400	800
Government Highway	State and Municipal	1 373	1 402	1 431	1 461	1 491
Street Lighting - RG&F	Customer Lighting	971	1,000	580	597	615
Subtotal	Customer Eighning	12 153	12 187	12 081	12 521	13 271
Custotal		12,100	12,101	12,001	12,021	10,211
Capacity						
Station 82 Upgrades	Substation New and Upgrades	15 899	11 701	28 433	14 193	12 251
Station 156 Transformer and Facilities Upgrade	Substation New and Upgrades	4 140	7 944	10 154	3 279	-
Station 192 Liborades	Substation New and Upgrades	2 148	5 832	4 412	1 448	_
Station 168 - Senice Area Reinforcements	Substation New and Upgrades	0 /70	3,002		1,440	
New 115-12.5 kV Station on Manitou Road	Substation New and Upgrades	5,475	5,022		-	5 300
Station 67 - Add Second 115-34 5kV/ Transformer	Substation New and Upgrades					4 500
Station 07 - Add Second 113-34.5KV Hanstonner	Substation New and Upgrades	-	-	-	-	4,000
Station 05, ADD NEW Transformer Perloament and Ungrade	Substation New and Upgrades	-	-	-	-	4,300
Station 215 transformer Replacement and Opgrade	Substation New and Opgrades	-	-	-	-	3,271
Rochester Area Reliability Project -RARP	Large Capacity Projects	104,378	5,877	-	-	
Subtotal		136,045	35,175	42,999	18,920	29,709
Accest Condition Polichility, Decilionary						
Asset Condition, Reliability, Resiliency	Substation Debuild	0.120	6 651	6 229	10 174	2 027
Station 43 Modernization Project	Substation Rebuild	9,139	6,651	6,338	13,174	3,037
Substation Circuit Breaker Replacement Program	Substation Rebuild	3,974	4,076	4,178	4,284	7,717
Station 5 - Modernization Project	Substation Rebuild	15,735	8,337	40	-	-
Station 127 - 115 kV System Upgrade	Substation Rebuild	13,387	4,928	-	-	-
Station 204 Upgrade	Substation Rebuild	602	645	2,450	6,353	6,973
Station 210 - Transformer Replacement and Modernization	Substation Rebuild	-	-	-	-	10,676
Substations	Substation Rebuild	885	902	920	939	958
Substation Battery Replacement Program	Substation Rebuild	884	902	920	938	957
Station 38 - Total Refurbishment	Substation Rebuild	3,723	-	-	-	
Station 418 Upgrades	Substation Rebuild	2,595	-	-	-	
Betterments	Betterments	4,153	4,278	4,406	4,538	4,674
Station 46 - Replace #1 and #3 Transformer Banks	Transformer Replacement	3,428	6,546	9,043	14,455	9,165
Station 117	Transformer Replacement	5,450	8,370	4,916	1,327	-
Station 49 - Transformer and Switchgear	Transformer Replacement	5,179	27	-	-	
RGE Transmission Power Transformers Renewals	Transformer Replacement	-	-	-	-	5,000
Station 158 - Replace Two 115/34.5 kV Transformers	Transformer Replacement	-	-	-	620	-
Distribution Line Inspection Repairs	Distribution Line Inspection (DLI)	2,652	2,732	2,814	2,898	2,985
Add 35kV Circuit - Offload Circuit 778	Conductor Replacement	34,570	49,141	50,000	-	-
Distribution Line	Conductor Replacement	8,710	8,971	9,240	9,517	9,803
Lines 901, 902 and 744 Replacement	Conductor Replacement	125	250	2,000	20,000	20,000
Add 35kV Circuit (S42 - S420 - S62 - S85), Offload Circuit 780	Conductor Replacement	100	750	10,000	13,000	-
Line 726 Upgrade - 34.5 kV	Conductor Replacement	690	1,035	6,900	10,350	-
Cable Replacement C759-740	Conductor Replacement	11,335	806	-	-	-
Line 701 Upgrade - 34.5 kV	Conductor Replacement	345	518	3,450	5,175	-
Line 754 - 34.5 kV	Conductor Replacement	-	330	495	1,576	4,950
Line 761 - 34.5 kV	Conductor Replacement	-	-	726	1.089	3,630
Transmission Line	Conductor Replacement	991	1.021	1.051	1.083	1,115
Line 739 - 34.5 kV	Conductor Replacement	-	149	248	1,485	3,069
Line 794 - 34 5 kV	Conductor Replacement	-	-	-	1 286	1 231
Line 775 - 34 5 kV	Conductor Replacement	-	-	158	263	1 575
Line 753 - 34 5 kV	Conductor Replacement		56	94	563	1 163
Line 717 - 34 5 kV	Conductor Replacement	38	63	378	781	1,100
Line 917 - 115 k/	Conductor Replacement	-	-	-	675	
	Positionov	-	- 0.000	-	10 5 40	12 000
Resiliency Plan Large Projects	Pesilionov	0,070	0,200	10,200	10,540	5 000
NGaL - Nesillency Flan Large Fl0jects	Other Asset Condition	-	-	-	-	5,000
Filor whe replacement Floject	Other Asset Condition	3,418	2,280	0,038	2,509	4,404
	Other Asset Condition	2,025	2,035	107.001	-	-
Subiotal		141,403	124,665	137,601	129,419	120,134

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Exhibit 14 RG&E Electric	Exhibit 14 RG&E Electric Capital Project List – cont'd. (\$ in thousands)						
		Forecast	Forecast	Forecast	Forecast	Forecast	
Description	Sub-Category	2020	2021	2022	2023	2024	
System Operations	On emplished	074	000	000	000	000	
General Equipment - Operations T&D	Operations	274	282	290	299	308	
RGE General Equipment - Substations	Operations Storm Bostoration	155	158	161	165	168	
Storm Restoration	Storm Restoration	341	351	362	3/3	384	
Subiolal		770	791	013	030	000	
Compliance							
BES Program - FERC Compliance	BES	12 210	20 171	14 433	8 097	35 233	
NERC Alert Priority III	NERC Alert III	1 000	1 000	1 000	1 000	1 981	
Subtotal		13.210	21,171	15,433	9.097	37.214	
		- / -	,	- /	- /		
Modernization							
Distributed Energy Resource Management System (DERMS)	Business Systems	-	-	-	-	1,000	
RG&E Distribution Automation	Business Systems	-	-	-	-	238	
Communications for Automation Programs	Business Systems	40	41	41	42	-	
AMI	AMI	19,070	34,653	24,776	22,149	5,921	
Substation Automation Program	DSIP	3,639	3,870	3,947	4,008	5,081	
REV - Electric Vehicles	DSIP	2,156	2,516	2,516	-	2,516	
Non AMI DSIP ADMS	DSIP	1,490	1,400	1,400	1,000	-	
Non AMI DSIP Enterprise Analytics	DSIP	642	919	492	-		
AM&P REV Support RG&E - Capital	DSIP	297	297	297	297	419	
Hosting Capacity	DSIP	-	151	-	-	-	
Interconnection Services	DSIP	84	-	-	-		
Domo Drojecto	DSIP	13	-	-	-		
Subtotal	DSIP	27 /22	12 9/6	- 22.460	- 27.405	- 15 175	
Subtotal		27,432	43,840	33,409	27,495	15,175	
Generation							
S5 Tunnel System	Generation Asset Condition	-	-	100	1,600	300	
S5 Unit 3 Turbine-Generator New Turbine Isolation Valve	Generation Asset Condition	-	25	250	1,000	75	
S5 Spillgate #2 Rock Stabilization - 1st priority	Generation Asset Condition	75	125	1,000	75	-	
S5 Powerhouse & Surge Tank Gorge/ Rock Stabilization	Generation Asset Condition	850	250	50	-	-	
S5 Spillgate #5 Rock Stabilization - 2nd priority	Generation Asset Condition	-	-	-	-	1,000	
S5 Unit 3 Turbine-Generator New Runner	Generation Asset Condition	-	-	-	100	900	
S5 Spillgate #5 Rock Stabilization - 2nd priority	Generation Asset Condition	-	-	-	-	1,000	
S5 Gate 2 Hinge Upgrade	Generation Asset Condition	50	750	25	-	-	
S5 Gate 5 Rubplate and Bottom Seal Upgrade Project	Generation Asset Condition	-	-	25	725	25	
S5 Gate 4B Rubplate and Bottom Seal Upgrade Project	Generation Asset Condition	-	-	-	25	725	
S170 Tailrace River Wall Restoration	Generation Asset Condition	-	-	-	-	325	
S2 Unit 1 Turbine-Generator Exciter	Generation Asset Condition	50	250	-	-	-	
S2 Gate 1 - Upper Extension	Generation Asset Condition	50	250	-	-	-	
S170 Drait Tube and Foundation Restoration	Generation Asset Condition	-	-	-	-	225	
S20 Johnson-Seymour Race - Gale 1 thru 3 builtheau?	Generation Asset Condition	-	-	- 75	-	225	
Station 26 Draft Tube and Foundation	Generation Asset Condition	- 50	-	75	125		
S26 Penstock / Scroll Case Ungrade Project	Generation Asset Condition	-	_	_	-	50	
S26 Intake Structure Upgrades	Generation Asset Condition	-	-	-	-	50	
S5 Ventilation System	Generation Asset Condition	-	-	-	-	50	
S170 Draft Tube and Foundation Restoration	Generation Asset Condition	-	-	-	25	-	
S170 Tailrace River Wall Restoration	Generation Asset Condition	-	-	-	25	-	
S26 Johnson-Sevmour Race - Gate 1 thru 3 bulkhead?	Generation Asset Condition	-	-	-	25		
S5 Pier Foundations and Overhead Superstructure Demolition	Generation Asset Condition	-	-	-	-	25	
Station 2 Modernization	Generation Capacity	6,348	15,113	10,953	7,600	11,800	
Fossil Hydro Operations Minor Projects	Generation System Operations	1,500	1,500	1,500	1,500	1,500	
S170 Dam Resurfacing Project	Generation System Operations	-	50	750	750	-	
S170 Dam Resurfacing Project	Generation System Operations		-	-	-	50	
Subtotal		8,973	18,313	14,728	13,575	18,325	

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Exhibit 15 NYSEG Gas Capital Project List (\$ in thousands)

Description	Sub-Category	Forecast 2020	Forecast 2021	Forecast 2022	Forecast 2023	Forecast 2024
Customer						
Install New Gas Services	New Installations	\$ 3.777	\$ 3.853	\$ 3.930	\$ 4.009	\$ 4.090
Gas Distribution Mains - New Installations	New Installations	3 380	3 447	3 517	3 587	3 659
Town of Maine Franchise Expansion	New Installations	1 450	-	-	-	-
Large Government Jobs	State & Municipal	-	2 493	2 545	2 599	2 654
Minor Government Jobs	State & Municipal	1 563	1 594	1 626	1 659	1 692
NYSDOT Route 6/Metro North Bridge Replacement	State & Municipal	500	-	-	-	-
Gas Meters	Meters & Regulators	2 500	2 000	2 400	2 800	4 000
Gas Regulators	Meters & Regulators	317	323	330	337	400
Subtotal		13,486	13.710	14,348	14,991	16,495
			10,110	1 1,0 10	1 1,00 1	10,100
Asset Condition & Reliability						
Leak Prone Main Replacement Program	Leak Prone Main & Services	21,576	22,458	22,951	22,954	23,436
Leak Prone Services Replacement Program	Leak Prone Main & Services	6,014	6,134	6,258	6,384	6,512
Non-Leak Prone Services Replacement Program	Leak Prone Main & Services	5,881	5,999	6,119	6,242	6,367
Slaterville	Leak Prone Main & Services	-	1,000	15,000	-	-
West Genesee Street Leak Prone Main Replacement	Leak Prone Main & Services	1,400	1,000	1,000	1,500	-
Boswell Hill Bare Steel Main Replacement Project	Leak Prone Main & Services	-	-	-	-	2,240
Gas Regulator Modernization & Automation Program	Regulators & Gate Stations	3,024	3,024	3,024	3,024	3,024
Hornby Station Rebuild	Regulators & Gate Stations	3,000	-	-	-	-
Vienna Rd-Macedon Feeder Main Replacement	Distribution Mains	19,000	1,000	-	-	-
Gas Distribution Mains - Replacements	Distribution Mains	2,690	2,744	2,799	2,856	2,913
Chambers Road Gas Main Replacements	Distribution Mains	500	500	500	500	-
Post Creek, Gas Main Replacements	Distribution Mains	500	-	-	-	-
Phelps (South) Transmission Replacement	Transmission Mains	132	-	-	-	-
Albion - Eastern System Improvement and Reliability Project	System Reliability	-	-	500	2,000	2,000
Low Pressure Relief Valve Program	System Reliability	500	500	500	500	500
Interconnect Between Wallace and Dansville	System Reliability	-	-	400	1,000	1,000
Pendleton - South West System	System Reliability	-	2,000	-	-	-
Fuller Hollow Rd 25 psig Loop	System Reliability	-	-	-	-	1,583
Canandaigua Feeder Main Reinforcement Project	System Reliability	-	100	900	-	-
Homer System Upgrade	System Reliability	910	-	-	-	-
Gasport - New Canal crossing	System Reliability	65	500	-	-	-
Gas Operations General Equipment	Other Asset Condition	820	838	855	873	891
Critical Valve Installations, Binghamton	Other Asset Condition	150	153	156	160	163
Subtotal		66,161	47,951	60,963	47,993	50,631
			,	,	,	· · · ·
Modernization						
Gas RTU/Telemetry Upgrades	Business Systems	2,000	2,000	2,000	2,000	-
Gas RTU/Telemetry and Zeck 9000 Odorizer Upgrades	Business Systems	3,800	3,325	500	-	-
AMI	AMI	10,534	21,668	16,409	12,925	3,502
Subtotal		16,334	26,993	18,909	14,925	3,502

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Exhibit 16 RG&E Gas Capital Project List (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Customer						
Install New Gas Services	New Installations	2,562	2,614	2,666	2,720	2,775
Gas Distribution Mains - New Installations	New Installations	1,753	2,672	2,726	2,781	2,837
Incremental Customer Growth - Gas Related Projects	New Installations	2,219	2,264	2,310	2,357	2,300
MF14 Greece: Lake Avenue (Port of Rochester), Install Gas Mains	New Installations	-	2,500	-	-	-
Large Government Jobs	State & Municipal	-	2,493	2,543	2,594	2,594
Minor Government Jobs	State & Municipal	640	653	667	680	694
Gas Meters	Meters & Regulators	2,100	2,144	2,300	2,600	4,000
RG&E - Gas Regulators	Meters & Regulators	50	55	60	65	70
Subtotal	-	9,325	15,395	13,271	13,796	15,269
Assot Condition & Polishility						
Asset Condition & Reliability	Leek Drone Main & Conjese	10.014	10.200	10 700	20,492	20 590
Leak Prone Main Replacement Program	Leak Prone Main & Services	19,014	19,396	19,700	20,103	20,569
Leak Prone Services Replacement Program	Leak Prone Main & Services	3,341	3,406	3,470	3,540	3,362
Non-Leak Prone Services Replacement Program	Leak Prone Main & Services	3,308	3,374	3,442	3,511	3,618
Cabot Line Replacement	Leak Prone Main & Services	500	500	-	-	-
Gas Regulator Modernization & Automation Program	Regulators & Gate Stations	2,820	3,998	4,079	4,161	4,245
Caledonia Gate Station Rebuild	Regulators & Gate Stations	182	-	-	1,000	17,000
Mendon Gate Station	Regulators & Gate Stations	182	-	-	1,000	1,000
Gas Distribution Mains - Replacements		976	996	1,016	1,036	1,057
CM-1 Transmission Gas Main Replacement Project		6,420	20,000	20,000	500	-
		-	-	2,000	3,000	7,000
CM-1A Transmission Pipeline: CM-1 to Brockport	Transmission Mains	-	1,000	1,500	-	-
CM-1 - Chill Gate Station to Ballantyne Ro		279	-	-	1,000	500
CM3D Transmission Pipeline - Rte 441 to whitney Rd		1,500	-	-	-	-
MF120 Western Monroe: Section 1 (Union St A - Chill Ave - Chill Scottsville Rd)	System Reliability	-	-	1,000	4,000	4,000
MF120 Eastern Monroe, State Road	System Reliability	-	250	6,000	-	-
MT Read SF115 psi	System Reliability	-	-	150	2,650	-
MF60 Southeast Phase 1 (Mendon Gate - Rte 64	System Reliability	115	2,000	-	-	-
MF60 Southeast Phase 3 (Malone Rd)	System Reliability	100	1,200	-	-	-
MF42 Henrietta: Brighton Henrietta Town Line Rd Improve	System Reliability	-	1,100	-	-	-
MF35 Walworth System Improvement	System Reliability	206	700	-	-	-
MF60 Southeast Phase 2 (Willis Hill Rd)	System Reliability	35	600	-	-	-
MF14 Greece: Mt Read Blvd	System Reliability	-	550	-	-	
MF120 Western Monroe: Section 2 (Union St A)	System Reliability	-	-	-	500	-
MF60 Southwest: Simmons Rd Reinforcement	System Reliability	275	-	-	-	
MF120 Western Monroe: Section 3 (Whittier Rd A)	System Reliability	-	-	-	250	
MF120 Western Monroe: Section 4 (Whitter Rd B, Union St B)	System Reliability	-	-	-	250	-
MF14 Greece: Ridge Rd, Install Gas Mains, Roch	System Reliability	-	250	-	-	
MF120 Western Monroe: section 6 (Property 1104/Gillett Rd - Manitou Rd),	System Reliability	-	-	-	50	-
Gas Operations General Equipment	Other Asset Condition, Reliability	273	278	284	290	296
RG&E Transmission Short Segments, Install Gas Mains	Other Asset Condition, Reliability	200	200	200	200	200
Subtotal		39,726	59,801	62,933	47,128	63,086
Modernization						
AMI	AMI	8,024	19,098	16,253	14,082	3,840
		,, ,	,,	.,	.,	-,

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Exhibit 17 NYSEG Common Capital Project List (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020 🔻	2021 💌	2022 🔻	2023 🔻	2024 🔻
Information Technology						
Client Project Requests and Integration Projects	Information Technology	6,796	7,995	8,156	8,320	9,767
Telecomm NY WAN Expansion	Information Technology	8,436	8,299	5,846	459	459
Siemens Spectrum Upgrade to V7	Information Technology	-	-	150	6,000	3,000
SMARTERWORKPLACE	Information Technology	-	2,590	-	-	2,645
Lifecycle Replacement - ECC/XECS systems	Information Technology	665	699	733	956	2,141
Unix Lifecycle	Information Technology	915	934	954	974	994
Storage Lifecycle	Information Technology	653	666	680	695	709
Disaster Recovery Lifecycle	Information Technology	994	994	994	-	-
Wintel Lifecycle	Information Technology	470	480	490	501	511
SAP Enhancements	Information Technology	-	-	599	1,656	-
NetEng LC-Asset Replcmnt	Information Technology	532	543	554	565	-
BMS System	Information Technology	600	1,500	-	-	-
OMS Enhancements	Information Technology	375	375	375	375	375
Database Lifecycle	Information Technology	367	375	367	367	367
Laptop Lifecycle	Information Technology	367	367	367	367	367
Desktop Lifecycle	Information Technology	342	349	356	364	371
NetSec Lifecycle	Information Technology	222	227	231	236	817
Toughbook Lifecycle	Information Technology	320	326	333	340	347
Workload Management and Optimization	Information Technology	930	235	-	-	-
Document Management System	Information Technology	171	137	140	143	-
VoIP endpoint project (Phone system) PBX Replace	Information Technology	150	50	50	50	50
IUSA-VOIP	Information Technology	300	-	-	-	-
Subtotal	-	23,605	27,142	21,375	22,366	22,921
Fleet						
Fleet Purchase	Fleet	14,057	20,538	10,174	3,623	12,299
Fleet Light Duty Vehicle Leases	Fleet	1,371	3,012	3,393	3,400	5,882
Fleet - General Equipment	Fleet	-	-	-	-	100
Subtotal	-	15,428	23,550	13,567	7,023	18,281





Exhibit 17 NYSEG Common Capital Project List – cont'd (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Facilities						
Facilities Projects	Facilities	1,415	1,415	1,415	1,415	3,010
Human Resource Training Projects	Facilities	40	800	4,500	-	800
Building Projects and Space Management Projects	Facilities	500	500	500	500	500
Telematics Replacement Project	Facilities	-	-	-	-	2,223
Site Upgrades	Facilities	-	-	-	-	1,450
Generator Upgrades	Facilities	100	-	250	350	600
Elmira Service Center - Space Efficency Renovation	Facilities	-	70	700	-	-
Roof Upgrades	Facilities	-	-	-	750	
Long Lake Upgrades	Facilities	-	-	750	-	-
Brewster Service Center - Space Efficency Renovation	Facilities	-	-	-	50	500
Misc General Construction	Facilities	-	-	-	-	550
Video Conferencing Equipment	Facilities	89	89	89	89	150
Deposit Upgrades	Facilities	-	-	500	-	
Oneonta Chiller Emergency Replacement	Facilities	-	-	500	-	
Oneonta Service Center - Space Efficency Renovation	Facilities	-	-	45	450	
Cortland - Renovations	Facilities	40	400	-	-	-
HVAC Upgrades	Facilities	-	-	-	-	375
Auburn Service Center - Space Efficency Renovation	Facilities	-	-	30	300	-
OH Door and Mandoor Upgrades	Facilities	-	-	-	-	300
Hammondsport - Renovation	Facilities	-	-	25	250	
Minors - Training Room Upgrades	Facilities	50	50	50	50	50
KGO HVAC Upgrades	Facilities	250	-	-	-	-
Window Upgrades	Facilities	-	-	-	-	250
Liberty Site Upgrades	Facilities	-	-	-	250	
Hamburg Service Center - Space Efficency Renovation	Facilities	-	-	-	20	200
Mechanicville - Generator Upgrade	Facilities	200	-	-	-	-
Lancaster - Car Ports	Facilities	200	-	-	-	-
Storage Barn	Facilities	-	200	-	-	-
Exterior Façade	Facilities	-	-	-	-	150
Minors - Capital Chairs and Varidesks - Opco wide	Facilities	-	-	-	-	100
Kirkwood General Office - AECC Renovation	Facilities	-	-	-	-	50
Plattsburgh - Space Efficency Renovation	Facilities	-	-	-	-	50
Unassigned Projects - potential Operations impact	Facilities	-	-	-	-	50
Interior and Exterior Lighting Upgrades	Facilities	-	-	-	-	50
Electric Service and Distribution Upgrades	Facilities	50	-	-	-	-
Subtotal		2,934	3,524	9,354	4,474	11,408
Security						
System Cutover	Security	16,229	20,465	31,144	8,456	5,637
Fire Protection	Security	1,875	2,500	2,500	2,500	2,500
Security Hardening	Security	350	357	365	373	380
Subtotal		18,454	23,323	34,009	11,328	8,518
One section of Taskaslam.						
	Operational Technology	2 7E 4	2 754	2 754	2 754	2 7E 4
		2,754	2,754	2,754	2,754	2,754
Telecomm Initastructure	Operational Technology	2,553	2,667	2,603	1,882	1,827
l'elecomm vertical Builds	Operational Technology	2,754	2,295	1,147	459	459
Historian and Analytic Upgrades Program	Operational Technology	-	3,379	-	3,600	-
Energy Control Systems Infrastructure	Operational Technology	315	315	315	1,500	400
NYSEG DSIP - Enterprise Analytics	Operational Technology		-	-	-	416
Subtotal		8,375	11,410	6,819	10,195	5,856
Other Common						
Laboratory Equipment	Other Common	100	100	150	100	250
Eitness Center equipment maintenance & upgrade	Other Common	-	-	-	-	13
Training Centers and Immersive Learning Techn (FR/AR)	Other Common	-	-	-	-	2
Company Adjustment Dec Prop	Other Common	(12)	327	(118)	(327)	-
Subtotal		88	427	32	(227)	271

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Exhibit 18 RG&E Common Capital Project List (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Information Technology						
Client Project Requests and Integration Projects	Information Technology	3,591	4,224	4,309	4,396	5,124
Siemens Spectrum Upgrade to V7	Information Technology	-	-	50	2,000	1,000
SMARTERWORKPLACE	Information Technology	-	1,295	-	-	1,322
Unix Lifecycle	Information Technology	472	482	492	502	513
Storage Lifecycle	Information Technology	353	360	368	376	383
Disaster Recovery Lifecycle	Information Technology	525	525	525	-	-
NY AMI Lifecycle	Information Technology	-	-	-	1,500	1,500
Wintel Lifecycle	Information Technology	266	271	277	283	289
NetEng Lifecycle	Information Technology	281	287	293	299	-
SAP Enhancements	Information Technology	-	-	293	838	-
Desktop Lifecycle	Information Technology	180	184	188	192	196
NetSec Lifecycle	Information Technology	117	120	122	125	432
Toughbook Lifecycle	Information Technology	168	171	175	179	182
Laptop Lifecycle	Information Technology	175	175	175	175	175
Database Lifecycle	Information Technology	168	171	175	179	-
Organic Growth ECC/XECS Systems	Information Technology	144	148	151	154	-
Workload Management and Optimization	Information Technology	470	120	-	-	-
IUSA-VOIP	Information Technology	368	-	-	-	-
VoIP endpoint project (Phone system) PBX Replacements	Information Technology	150	50	50	50	50
Database LC-Asset Replcmnt	Information Technology	-	-	-	-	182
Lifecycle Replacement - ECC/XECS systems	Information Technology	-	-	-	-	158
Subtotal		7,427	8,585	7,643	11,246	11,506
Fleet						
Fleet Purchase	Fleet	3,735	3,741	3,746	3,752	2,796
Fleet Light Duty Vehicle Leases	Fleet	827	910	1,001	1,101	2,971
Subtotal		4,562	4,651	4,747	4,853	5,767
Facilities						
Facilities Projects	Facilities	1,666	1,666	1,666	1,666	2,535
Building Projects and Space Management Projects	Facilities	500	500	500	500	500
Site Upgrades	Facilities	-	-	600	950	500
HVAC Upgrades	Facilities	-	50	250	550	250
Unassigned Projects - potential Operations impact	Facilities	-	-	-	-	850
Generator Upgrades	Facilities	-	-	500	200	100
Telematics Replacement Project	Facilities	-	-	-	-	796
OMS Enhancements	Facilities	125	125	125	125	125
Scottsville Rd Equipment Yard Upgrades	Facilities	500	-	-	-	-
Video Conferencing Equipment	Facilities	70	70	70	70	150
Scottsville Rd Exterior Façade Upgrades	Facilities	-	-	-	-	350
Interior and Exterior Lighting Upgrades	Facilities	-	-	-	150	200
Scottsville Rd Parking Lot Upgrades	Facilities	300	-	-	-	-
Demo Chem Lab and Coal Lab	Facilities	300	-	-	-	-
Parking Lot Improvement / Externtion	Facilities	-	-	-	-	250
Minors - Training Room Upgrades	Facilities	50	50	50	50	50
Exterior Lighting Upgrades	Facilities	-	-	150	-	-
Generator Installation	Facilities	-	-	-	-	150
Minors - Capital Chairs and Varidesks - Opco wide	Facilities	-	-	-	-	100
Subtotal		3,511	2,461	3,911	4,261	6,906

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Exhibit 18 RG&E Common Capital Project List – cont'd. (\$ in thousands)

		Forecast	Forecast	Forecast	Forecast	Forecast
Description	Sub-Category	2020	2021	2022	2023	2024
Security						
System Cutover	Security	8,994	10,910	12,727	4,448	2,965
Fire Protection	Security	1,132	1,090	1,090	1,090	1,090
Security Hardening	Security	200	204	208	213	217
Subtotal		10,326	12,204	14,026	5,751	4,272
Operational Technology						
Telecomm NY WAN Expansion	Operational Technology	3,364	3,295	2,607	298	298
Telecomm Vertical Builds	Operational Technology	2,754	2,295	1,147	459	459
Telecomm Infrastructure	Operational Technology	1,435	1,200	1,155	798	753
Telecomm Fiber	Operational Technology	918	918	918	918	918
Historian and Analytic Upgrades Program	Operational Technology	-	1,735	-	2,100	-
Energy Control Systems Infrastructure	Operational Technology	158	158	158	750	200
Non AMI DSIP Enterprise Analytics	Operational Technology	-	-	-	-	212
Subtotal		8,629	9,600	5,984	5,323	2,839
Other Common						
Non AMI DSIP Advanced Planning Tools	Other Common	-	-	-	-	1,577
Laboratory Equipment	Other Common	140	200	150	150	200
Fitness Center equipment maintenance & upgrade	Other Common	-	-	-	-	13
Training Centers and Immersive Learning (ER/AR)	Other Common	-	-	-	-	6
Subtotal		140	200	150	150	1,796

